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AUGUST 7, 1907.

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Filtration vs. Stripping Reservoirs

ON another page we present in a very condensed form an abstract of a report upon the stripping of the site of the Ashokan reservoir for New York's Catskill Water Supply, a large part of which is really a thesis upon stripping reservoir sites in general, and is based upon a thorough investigation of the subject by two engineers who are widely and favorably known for their work in the purification of water. Their advice with reference to the Ashokan reservoir is that the expense of stripping the site be saved, and that a plant for aeration and filtration be constructed to remove from the water any tastes or odors which might result from organic matter left in the soil. Part of their argument is that a thorough stripping of the soil—and by this is meant not the removal of trees, stumps and underbrush alone, but of all the soil which contains organic matter—is by no means a sure preventive of the growth of algæ, since food for these may be brought in by the inflowing streams and the seeds of the algæ be introduced either by the same means or through the air, and that the water should be filtered anyhow, and the additional cost of aeration and any increased burden of filtration would be much less than that of thoroughly stripping the immense area of the reservoir.

There will probably be few who will dispute with the authors concerning their conclusions, if they are properly interpreted, but it is to be hoped that there will be no misunderstanding of these. If it is certain that for the next ten or fifteen years a given water supply will not require filtration, unless for removing the effects of algæ, then it may be cheaper to prevent the formation of these by stripping the site beforehand. It is also to be borne in mind that the authors do not recommend leaving growing vegetation upon the site, or stumps, piles of brush, dead trees and other vegetable growths of large size, which are in some instances not removed on a score of mistaken economy, and which may result in a degree of pollution which even aeration and filtration would be ineffective in rectifying.

Another point referred to by the authors is the treatment with copper sulphate, which has been used successfully in many reservoirs, especially small ones, both in this country and England. As stated by them, this treatment affects the surface growths almost solely, killing off the algæ and other vegetable matters growing in the upper strata. If these have already attained considerable size the immediate effect may be an even further pollution of the water, which, however, may frequently be avoided by raking the masses of dead organisms onto the bank before active decomposition sets in. It is probable that much of this vegetable matter affected by the copper treatment will settle to the bottom and intensify the difficulty in the lowest water strata. It is, therefore, desirable to employ the copper sulphate at as early a stage as possible, in order that the putrescible matter produced by its action may be a minimum.

Sub-Draining Sidewalks

IT has come to be recognized as a standard form of construction to place under all classes of sidewalks foundation beds of cinders from 8 to 12 inches thick, the reason ordinarily and correctly assigned as the principal one being that this is to prevent the frost from heaving the paving. Judging from a great deal of such construction which we have seen, the method by which cinders effect this has not been inquired into or is misunderstood, for in a great many cases either the cinders are so used as not to produce the desired effect or they are unnecessary.

The object of the cinders is to permit water which shall find its way under the sidewalk to drain away, as where there is no water there can be no frost to destroy the pavement. If the natural soil is porous, so that water will naturally drain off immediately after a rainfall, cinders, although commonly used, are unnecessary, although they might be used for a very few inches because they compact under ramming without closing the pores better than would the natural soil. But perhaps the most common mistake is that of using cinders for draining off water without providing any point to which water can be drained or any outlet for such water. To place cinders under a walk which has a slight grade is to invite the water to gravitate to the lower end of such grade, and if this ends at a curb, as is generally the case, this means the collection of water at this point and a concentration of damage there, which may frequently be seen in the form of cracked pavement or open curb joints caused by the thrusting forward of the curb by frost. The best construction where a pavement is to be built on clay soil would be to place in the bottom of the cinder foundation a line of small cheap tile—2-inch drain tile would be sufficient—leading to the lowest point of that section of pavement, and providing an outlet there into the sewer, catch-basin or possibly the gutter. It might even be sufficient to omit the tile but to furnish the outlet as described, but the slight additional cost of the tile would be much more than repaid in increased certainty of drainage. The best practice in clay soils is to place a drain behind the curb, connected with the sewer, and cinders under the sidewalk and behind the curb, thus draining all this space.

City Wastes in Rochester

City Engineer Edwin A. Fisher, of Rochester, N. Y., has collected statistics concerning garbage and refuse collection in Rochester, and also those of other cities for comparison. In Rochester in 1903 the collection of 67,000 cubic yards of street sweepings cost about $79,000, or about $1.17 per cubic yard; the amount averaging 267 tons, or about 392 cubic yards, per 1,000 persons. The material was used for filling in low land. The amount was about 100 tons per 1,000 persons greater than the average of a number of United States cities, as reported by the United States Department of Agriculture in 1898.

Ash barrels in Rochester are supposed to receive also miscellaneous refuse, such as wood, straw, glass, etc., which mixture is generally used for filling low land. In summer ashes constitute about 25 per cent. of this refuse, and in winter about 80 per cent., the average for the year being about 50 per cent. The collection of this class of refuse in the years between 1900 and 1905 has amounted to from 584 to 642 tons, and the cost per capita has been from 47 to 53½ cents, and the cost per cubic yard for collection and disposal from 35 to 39.8 cents. A cubic yard of ashes is estimated by Mr. Fisher to weigh 1,600 pounds and a cubic yard of rubbish 200 pounds.

Garbage in Rochester is considered to include all putrescible matter, both solid and liquid, and is estimated to weigh about 1,169 pounds per cubic yard. The garbage receptacles are directed by ordinance to hold not less than three nor more than ten gallons each, a sufficient number being provided to allow for at least one gallon for each individual boarding in a given building. Garbage is collected daily in the more thickly populated portions of the city and from hotels and restaurants, and twice a week in the outlying sections during the summer and once a week during the winter. The garbage wagons have tight bodies of wood, holding 3.23 cubic yards when even full. They are supposed to be covered with canvas and to be disinfected when emptied. Mr. Fisher believes that steel wagons should be required in place of wooden ones.

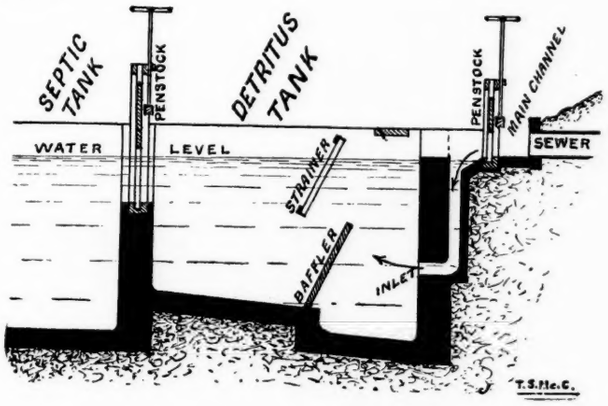
The collection and disposal of garbage is now done by private contract, but Mr. Fisher believes that it should be collected by the city and disposed of by cremation. In view, however, of the unsatisfactory results so far obtained in this country with this method, he recommends that the city enter into a five-year contract, under which the garbage shall be collected in steel wagons and disposed of in a satisfactory plant, land to be provided available for burying the garbage in case the plant shall become temporarily out of order. The ashes and rubbish, he believes, should be disposed of by the city, the latter being burned and the ashes used for filling.

Detritus Tanks

Wherever the sewers carry any appreciable amount of sand or other inorganic matters which could settle in a septic tank or tend to clog a filter bed, it is desirable to intercept them at the sewer outlet or even in some cases at an intermediate point in its length. When used in connection with a septic tank the aim is to get all soluble solid matter into the septic tank and keep out all the insoluble, and some engineers think that the partial failure of some tanks is largely caused by these aims not being realized, either an excess of insoluble solid getting into the septic tanks or too much of the soluble remaining in the detritus tank. In the former case the septic tank fills up and has to be cleaned out more quickly than is desirable or consistent with the best working; in the second, the detritus tank itself may become a septic tank, and creates a nuisance when cleaned out.

An English engineer, Theodore S. McCallum, has recently embodied, in works designed by him, a detritus tank shown in section in the accompanying illustration. The inlet is considerably below the surface level of the water, and a baffle retards the current and prevents it from taking a direct line to the further end. The larger and heavier solids are, therefore, desposited in the first or deeper part, while the lighter insoluble matter settles in the other portion. The location of the inlet below the surface prevents the smaller solids from being projected along the surface to the outlet. The special feature of this tank, however, is the penstock placed between the detritus tank and septic tank, with a sill about 18 inches or 2 feet below the top water level, thus making the detritus chamber and septic tank practically one as regards the liquid, the solids, however, being separated more or less

completely into soluble and insoluble. When the detritus tank is to be cleaned out, the penstock is closed and the water in the septic tank is not affected by pumping out or otherwise working in the detritus tank. The designer believes that the submerged inlet and its shape, combined with the baffling and strainer arrangement, permit a relatively small detritus tank to arrest all insoluble matter during the maximum rate of flow, the direct communication allowing complete septic action to dissolve such soluble matter as is retained in the detritus tank when the rate of flow is very small. The width and depth of the penstock should be large enough to prevent the current disturbing the scum, which should be entirely cleared by the opened penstock gate. The strainer extends only part way to the bottom, as it is required only for corks and other floating material of an insoluble nature.



McCALLUM DETRITUS TANK.

Asphalt Repair Plant

THE Metropolitan Street Railway Company of Kansas City, Mo., is required by its franchise to maintain the paving between their tracks and for eighteen inches outside; and for maintaining and repairing asphalt paving they have developed a plant whose operation seems to be quite successful. The heating pans are of quarter-inch boiler iron, 10 feet long, 5 feet wide and 10 inches deep in the middle, where they are strengthened by a cross-bar, the bottom being dished down from the sides to the center, which shape permits stirring irons to be used to the best advantage. Although this depth seems small, difficulty with stirring the material has led to the abandonment of deeper pans. Two of these pans placed end to end with a smoke stack between them are supported over each of four brick furnaces.

Old asphalt material, which is purchased from the city for 75 cents per wagon-load of 1½ cubic yards, is broken up into pieces about 5 inches square and the pans filled with it, where it is heated for about two hours, being continually stirred with bars in such a manner as to cause a vertical interchange, which not only prevents the asphalt from burning but also brings the gravel and other impurities to the surface where they can be removed. Water is added from time to time during the heating process. When all the material has reached the desired temperature, from 75 to 200 pounds of fresh asphalt, which has been previously melted in adjacent tanks, is mixed with it. The heated asphalt, after this mixing is completed, is placed in wagons, the two pans furnishing just one wagon-load.

Four double pans are in use at the same time ordinarily, each giving 4 or 5 wagon-loads per day. Four or five men are required for each pair of pans, work being started early in the morning and carried on until about 4 o'clock in the afternoon, which permits the laying to be done during ordinary working hours. Each wagon-load is sufficient to cover about 25 square yards with a 2-inch layer. The asphalt plant has a capacity of about 400 yards per day and cost approximately $400. Old railroad ties are used for fuel. The cost for labor, material, etc., is said to be about 40 cents per square yard. In connection with the re-use of old asphalt, the company believes that the reheated asphalt will last as long as would new material; some which has been in use for two years apparently corroborating this view.

Municipal Lighting in Canada

TWENTY-SEVEN per cent. of the electric light plants in Canada are municipal, 98 being owned by cities as against 259 private plants, according to the *Central Station List* for March, 1907. This is a slightly higher percentage than for the United States, the latter being at that time 24.9 per cent., or 1,096 as against 3,305 private electric light concerns. The exact percentage in Canada is 27.4, but it is probable that a few plants are omitted from the list, and the figures are not absolutely exact. More than half the total number are located in the province of Ontario, Quebec and Nova Scotia coming next in the list. The table by provinces is as follows:

	Municipal	Private	Total
Alberta	2	3	5
British Columbia	7	16	23
Manitoba	2	6	8
New Brunswick	5	11	16
Nova Scotia	6	20	26
Ontario	62	146	208
Prince Edward Island	0	3	3
Quebec	9	50	59
Saskatchewan	5	0	5
Yukon Territory	0	2	2
Newfoundland	0	2	2
Total	98	259	357

Most of the cities with municipal plants have a population of less than 10,000, except St. Thomas, Guelph, Glace Bay, Kingston, Fort William and Valleyfield (Quebec) and Victoria. In March, 1906, there were reported 80 municipal plants as against 98 a year later.

GAS

In New Brunswick, the city of Moncton owns its gas plant; the towns of Newcastle and Pictou acquired the gas plants, and discontinued them, supplying electricity instead. In the province of Ontario the cities of Belleville, Berlin, Brockville, Guelph, Kingston, London, Owen Sound, St. Thomas and Waterloo have municipal plants, and Sorel, in Quebec.

Virden, in the province of Manitoba, owns an acetylene gas plant, supplying a population of about 2,500; also Morris, Manitoba.

HIGH PRESSURE FIRE PROTECTION SYSTEMS

MR. FRED L. FORD, City Engineer of Hartford, Conn., and Ermon M. Peck, Consulting Engineer, have recently prepared a report on the subject of a proposed auxiliary high-pressure water supply for fire protection in that city, which has been submitted to the Common Council by the Presidents of the Boards of Fire, Street and Water Commissioners for whom the report was prepared. One of the most interesting parts of this report to the non-resident is a table giving various items of information concerning twenty-one cities in the United States and Canada whch have auxiliary fire protection systems.

In estimating upon the proposed system it was assumed that within the next forty years a height of sixteen stories was likely to be reached by buildings in the business district. The location of the hydrants was based upon a length of hose of 400 feet in the more important districts and 600 feet elsewhere. The pressure decided upon was 300 pounds, which is the maximum so far thought necessary by any American city. They estimate that to serve the area of 1.14 square miles which they advised should be so protected would require 10.12 miles of pipe, for which they propose diameters of 8 to 24 inches, immediate construction of 4.32 miles of this being recommended, which would protect the principal business portion of the city. The water would be pumped from the Connecticut river by either gas engines or steam turbines. The distribution system is estimated to cost $195,000; the cost of a gas-pumping plant, using producer gas, $378,000, and of a steam turbine and turbine pump, $258,000, the maintenance and operating charges for the gas-engine plant being estimated at $65,667 a year and of the steam turbine $87,904 a year. It is proposed using 20-inch gates on the 24-inch lines with reducers on either side, a plan discussed in a recent number of the MUNICIPAL JOURNAL. They advise fire hydrants with 8-inch barrels and four 2½-inch outlets, each outlet having an independent gate, these to be spaced 150 feet apart in the district where the fire risk is greatest, this space being increased to 200 feet for the intermediate sections and 300 feet for those where the risk is least.

FIRE PROTECTION IN TWENTY-ONE CITIES OF THE UNITED STATES

CITY	Estimated Population	Date of Installation	Source of Pressure	Gallons per Minute	Max. Pressure, Lbs	Lineal Feet of Mains	Sizes of Mains in Inches	No. of Hydrants	Total Cost of System	No. of Acres	Cost Per Acre	Connection with Buildings	Effect on Insurance Rates
Atlantic City..	40,000	Proposed...	1 Station: Electric Turbine Pumps....	7,000	225	38,590	8–14	82	$187,272	306	$612.	.....	.....
Baltimore.....	575,000	Proposed...	Pumping Station....	.....	....	75,900	10–20	....	*397,999	360	.....	Standpipes on B'ld'gs.	.....
Boston.....	620,000	1898.....	Fire-boat.....	6,000	200	4,700	12	14	30,080	65	463.	.....	.....
Brooklyn.....	1,400,000	Construct'g.	2 Pump'g Stations: elec. turbine pumps	32,000	300	.....	8–20	....	1,384,500	1420	975.	.....	.....
Buffalo.....	420,000	1897.....	3 fireboats.....	.....	300	12,756	12	....	.....	.....	.....	.....	Reduction of 30 cts. per. $1000.
Chicago.....	2,100,000	Proposed...	1 Station: Gas Triplex pumps.....	30,000	300	268,900	8–36	850	3,203,480	1280	2503.	No open connection....	Reduction of 25% assumed.
Cleveland.....	480,000	Construct'g.	To have p'mp'g st'n; at pres't 2 fireboats.	10,000	300	32,524	8–20	96	*170,000	338	.....	May have connection with Auto. sprinklers.	Reduct'n of 80 cts. per $1000 proposed.
Coney Island..	.....	1905–6.....	1 Station: Gas triplex pumps.....	3,600	150	.....	8–16	....	90,000	147	612.	.....	Reduction of 25%
Detroit.....	380,000	1893.....	2 fire-boats.....	10,000	210	25,831	8–10	95	.....	356	135.	.....	Probably has prevented an increase.
Fitchburg.....	33,000	.....	Gravity†.....	.....	180	28,250	8–16	....	50,000	346	144.	Boiler Feed, Elevators and sprinklers.....	Prevented an increase.
Hartford.....	08,000	Proposed...	1 Station.....	10,000	300	53,430	8–24	198	796,277	731.3	1089.	No open connection....	.....
Lawrence.....	75,000	1906.....	Gravity†.....	.....	134	10,200	10–12	30	.....	120	.....	.....	No change.
Milwaukee....	340,000	1889.....	3 fire-boats.....	15,000	250	45,717	6–12	183	.....	630	.....	.....	10% reduction.
Newark.....	200,000	1905.....	Gravity.....	3,500	165	15,000	20–30	52	135,000	303	446.	Some connections.....	10% reduction.
New York, (Manhattan)	2,100,000	Construct'g.	2 Stations: Electric turbine pumps.....	30,000	300	.....	12–24	1200	3,950,400	1430	2763.	Water curtains provided for.....	No change.
Philadelphia...	1,500,000	1903.....	1 Station: Gas triplex pumps.....	9,100	300	35,300	8–16	166	700,000	512	1367.	None on or in Buildings.....	Penalty of 25% removed.‡
Providence....	200,000	1897.....	Gravity.....	3,472	116	29,409	12–24	89	143,136	358	400.	5 automatic sprinklers.	No change.
Rochester.....	185,000	1874.....	2 Stations: Elec. tur. pump, steam tur., tur. pump.....	9,000	140	102,960	4–20	....	.....	.....	.....	Some connections.....	Graded reduction.
Toronto.....	215,000	Construct'g.	1 Station: Electric turbine pump.....	14,000	300	40,000	8–20	....	500,000	287	1742	Considering connect'n.	Uncertain.
Winnipeg.....	110,000	Construct'g.	1 Station: Gas producer, gas engine, triplex pumps.....	10,800	300	15,840	8–20	....	650,000	275	2364.	Connection with automatic sprinklers.....	Uncertain.
Worcester.....	138,000	.....	Gravity†.....	.....	165	100.320	8–30	....	.....	1380	.....	Elevators.....	No change.

* Exclusive of pumping station and equipment.
† System consists of extension of pipes from high service into district covered by low service.
‡ Board of Fire Underwriters have voted to reduce rates to the amount of 10 cents per $100. = a total of $40,000 if extensions costing $150,000 are made to the system.

STRIPPING RESERVOIR SITES

Report on Advisability of This, with Special Reference to the Ashokan Reservoir—Benefits of Stripping but Temporary—Aeration and Filtration Recommended Instead

A REPORT discussing the advisability of stripping the Ashokan reservoir site of New York City's additional water supply, and incidentally the general subject of stripping reservoirs, was made last winter by Messrs. Allen Hazen and George W. Fuller to Mr. Waldo Smith, chief engineer of the Board of Water Supply.

The report is very extensive, and many of the subjects discussed we cannot find space to even mention; but we endeavor to give our readers a brief summary of the chief arguments and conclusions.

The authors preface their report by the statement that the question is one largely of bad tastes and odors. These odors are produced by bacterial putrefaction of the bottom water and by deterioration of surface water due to algæ and other growths. The former occurs "when the amount of organic matter in the stratified bottom layer of water, or in the soil of the bottom and sides of the reservoir, or in the deposits or growths upon them, is so great that under the action of bacteria all of the oxygen in the water is used up in oxidating the organic matter," following which putrefactive decomposition results, one of the products of which is sulphureted hydrogen. The second condition, causing bad tastes and odors, usually results from algæ, protozoa and similar organisms, the odors being produced either by the organisms themselves or by oily secretions liberated upon their disintegration. These organisms grow largely upon the surface of the water in the presence of sunlight. Stripping a reservoir site affects these growths almost solely by removing food matter otherwise available from the sides and bottom.

The authors state that so far as they can learn the practice of removing soil from the bottom and sides of reservoirs to remove organic matter has been confined almost wholly to Massachusetts, having started in Boston about 1883. They then review at considerable length previous discussions which have been printed upon this subject from the report of Dr. John Torrey to the Croton Aqueduct Board in 1859 to the 1904 report of the Massachusetts State Board of Health. General experience with large reservoirs they have found to indicate that stripping reservoir sites merely delays stagnation until a deposit of organic matter has been formed.

Concerning the objectionable effects of stagnation of the bottom water they state that "the amount of free carbonic acid in the water increases during the time when the oxygen is being exhausted through the action of bacteria upon the organic matter. This increase in free carbonic acid facilitates solvent action of the water upon lead pipes, and in Great Britain seems to have had considerable practical significance with reference to lead poisoning." Odors of putrefaction of organic matter are found in the bottom layers and are largely due to sulphur and phosphorus. They result from the putrefaction of various kinds of organic matter, both that originally growing in the soil of the bottom and that settling down from the supernatant water.

The organic matter dissolved in water and the iron extracted from the soil cause an unsightly appearance of the water, which appearance is increased by partial aeration. Many kinds of organisms are found in the bottom layers, chiefly fungi, which grow in large numbers in stagnant water. Algæ and diatoms, when found there, have apparently settled down from above. Increase of color and odors of decay are practically universal in stagnant bottom waters.

Discussing the relation of stripping to the quality of top water, including odors of growth and disintegration, the authors state that the report of Messrs. F. P. Stearns and T. M. Drown, which appeared sixteen years ago in the Massachusetts State Board of Health, had been studied and supplemented by additional investigation, largely by Mr. George C. Whipple, this embracing 110 reservoirs in Massachusetts, 16 in Connecticut, 16 in New York State, and a few others. The results obtained by these have been contradictory and inconclusive, the most important conclusion drawn being that "there are many conditions which affect the growth of organisms producing tastes and odors in reservoirs. Growths are the result of a combination of a number of favorable circumstances. Stripping reservoirs is one of the conditions which tends to influence the growths in a reservoir, but there are other conditions which exert as much influence as stripping, or, even under similar conditions, a much stronger influence. Generally to produce troublesome growths of organisms it is necessary that the reservoir should be seeded or infected with the organisms; that the temperature of the water should be suitable for this growth; that sufficient food supply for the organisms should be present, and that the water should be sufficiently quiet and free from physical disturbances to allow their development. The absence of any of these necessary conditions will keep the water free from growths, even though the other conditions are favorable." Seeding cannot be prevented, and its cause is unknown; the spores, however, are probably brought to the reservoirs by either inflowing water or the wind. The growths of the organisms may not lead to noticeable conditions, either of odor or others, and it is probable that they frequently occur entirely unsuspected by the consumer. Nitrogenous matter does not appear to be essential for the growth of organisms, recent studies indicating that "the carbon of organic matter, particularly in the form of free carbonic acid, plays an important part as a source of food for organisms." This departure from previous ideas on this subject, however, does not effect the desirability of covering reservoirs containing organically pure water, since

such water deteriorates rapidly when exposed to the sunlight through the action of organisms developing rapidly under such conditions. The food, whether nitrogenous or carbonaceous, may result from vegetable growths in the reservoir, may be introduced from the surrounding catchment area, or may be due to dead organisms or to sewage pollution. The temperature of the surface water has an immediate effect on the growth of organisms. Protozoa and diatoms are not necessarily inhibited by winter weather, but the blue-green algæ which are such a nuisance in so many reservoirs require a temperature of about 70° for abundant growth. Wind and agitation will, if sufficiently violent, retard or prevent the growth of organisms. The physical features of reservoirs, their area, depth, volume as related to storage period, and soil conditions were all considered; since large area increases wave action and is unfavorable to the growth of organic matter in the surface waters; depth is, on the whole, unfavorable to their growth; storage for long periods favors stagnation and stratification, and, if accompanied by exposure of the bottom slopes, a growth of weeds will result; soil conditions affect the amount of organic matter which the stored water can receive and also the extent of weed growth on the slopes.

The remedies for the conditions outlined are aeration, filtration, a combination of both, or, for the top water, treatment with copper sulphate. Aeration has been little used, but is growing in favor. It saturates water with oxygen, aids in decolorization, diminishes the free carbonic acid and the action of lead pipes due to the same, as well as the organic growths for which it forms a food, and removes substances like sulphureted hydrogen which are generally present in the stagnant bottom layers. But its effect is confined largely to tastes and odors, and it has little beneficial effects upon fungus growths or organic matters which, after aeration, are united more or less completely to a precipitate of iron. Not only odors already existing, but those which might form from the future decomposition of small amounts of organic matter, may be prevented by aeration; on the other hand, there are undoubtedly some tastes and odors which cannot be adequately removed by any practicable amount of aeration.

Filtration apparently has not been used directly for stagnant bottom water; in fact this is so polluted that intermittent treatment or some other applicable to sewage would be required. Filtration of the top water for reducing tastes and odors has been tried within the past year or two with apparently favorable results. Aeration and filtration combined, however, have been used in several instances, the first probably having been at Reading, Pa. A four-acre filter plant is in use in Springfield, Mass., and at Charleston, S. C., an aeration and mechanical filtration plant has recently been installed.

In connection with the combined aeration and filtration of bottom water, the authors state that remarkable results have been obtained when an amount of oxidizable organic matter in excess of the dissolved oxygen is present in the water at the beginning of the season and there is also present a sufficient amount of iron. The first condition always exists, except in large reservoirs which are carefully cleaned, but the presence of iron is more uncertain. The incoming water does not often bring sufficient for this purpose, but the soil in the reservoir bottom is sure to contain a large amount of iron, which is brought into solution by the fermentations which take place, or the iron may come from the suspended matter in the incoming water. The effect produced by these two conditions is that the iron in a ferrous state becomes insoluble when aerated, and serves to a substantial extent as a coagulant in removing color and other organic matter, and the water thus produced may be more acceptable in every way than could possibly have been obtained by filtration before stagnation and fermentation.

Of the copper sulphate treatment, of which much has been written of late, the authors state that its safe use requires much more care than appears to be realized by some, and that there are apparently limitations to its general use which are not fully appreciated; they doubt the desirability of using it in such a large reservoir as the Ashokan, which will cover twelve square miles, preferring aeration and filtration, which are highly desirable for other reasons and will fully prevent any unsatisfactory results from algæ growths.

In their conclusions the authors state that stripping the sides and bottoms of a reservoir will ordinarily prevent stagnation of the bottom layers for a period of years, whose length depends upon various local conditions, about ten to twenty years having been the time noticed for the Boston reservoirs. Ultimately, however, it makes but comparatively little difference in such stagnation. The food obtained for sustenance of organisms from organic matter originally upon the bottom and sides of reservoirs is only one of various sources of food which will bring about these growths, when other conditions are suitable. During the first ten to twenty years there is a slow but steady elimination of organic matter from the bottom and sides of unstripped reservoirs by bacterial action, and an equally slow and steady accumulation of organic matter resulting from growths of organisms in all reservoirs, whether stripped or not, in this climate. It results that ultimately it makes little difference whether the reservoir was originally stripped or not. By aeration and filtration of the bottom water of deep reservoirs there can be obtained a better quality of water without stripping than it is possible to obtain with stripping, but without aeration and filtration.

Nothing is known which can be done to exterminate algæ from ponds in which they occur. Natural ponds and lakes, having clean bottoms and sides, give more trouble from growths of organisms at intervals than was formerly realized; which ignorance is partly associated with the seeding of the water and partly with the meagreness of available observations. Aeration will greatly improve the quality of water as to tastes and odors, and for a comparatively small expense will do as much or more toward removing the effects of these growths than stripping will do toward preventing them; but filtration alone

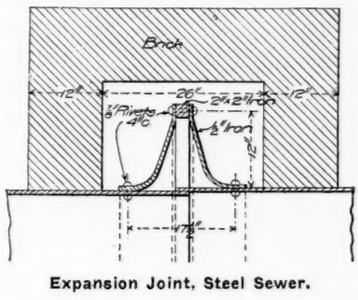
may not be satisfactory. "In view of the above, and as aeration and filtration will ultimately be required in order to obtain satisfactory results in this climate, present evidence and experience indicate that beyond grubbing a reservoir, it is unwise to spend money for further removing organic matter from the bottom and sides. In fact, since stripping the bottom will not prevent the ultimate presence of objectionable tastes and odors, it seems to be apparent that in many reservoirs the removal of these will require aeration and filtration, no matter what treatment the bottom had originally received. It is to be noted that the stripping of the reservoir sites referred to by the authors is not merely the grubbing and removal of stumps and bushes, but refers to the total removal of the top foot or two of soil, including all of the humus, fine roots and other organic matter.

STEEL PIPE STORM SEWER

Sewer Under Head of Sixty-five Feet—Pile Support on Swampy Ground—Bridge Support for Overhead Crossing—Expansion Joint

It is not often that a large sewer is designed to be under internal pressure for any considerable length, but the topography is such between Jersey City and the Hudson River where its sewers discharge as to place about a mile of the outlet sewers below the hydraulic gradient, the maximum head being 65 feet. To meet this condition there is now being constructed, to remove the storm water from a high 600-acre section of that city known as the Hudson City section, an 8-foot riveted steel sewer about a mile in length. This sewer at the outlet is 4.5 below mean sea level and at its upper end about 63 feet higher; while the average elevation of the area drained is about 125 feet higher than the outlet. This sewer is being built to supplement a 5½-foot riveted steel sewer which has been rendered inadequate by the development of this section. The new sewer will receive the flow from a 5-foot brick sewer which traverses the district and also from cast iron and steel pipe extensions of several old sewers. The sewer crosses under several tracks of the Erie Railroad and for a considerable part of its length is laid in the meadows which are largely muck and swamp.

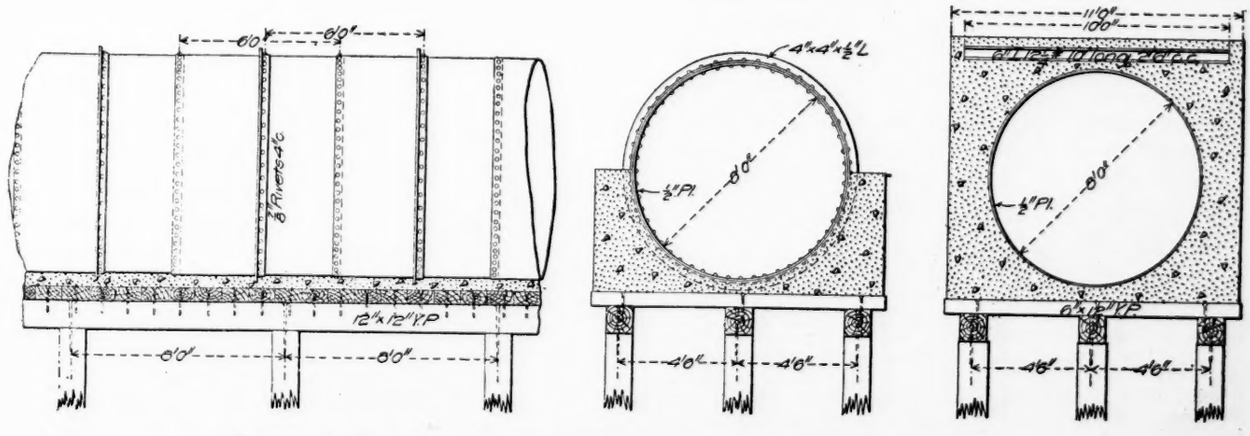
In constructing the sewer half-inch steel plates were used, 6 feet 3 inches wide, with all seams single riveted with ⅞-inch rivets 4 inches between centers, the lap being 3 inches. Half way between the circular seams angle iron stiffeners of 4x4 half-inch angles are riveted on the outside. The pipe is made and delivered in 18-foot sections, which are given a coating of asphalt at the shop. The sections weigh about six tons each and are delivered by the Erie Railway on flat cars, two sections to a car. A Brown locomotive crane is used for unloading, and piles the pipe on both sides of the side track (which track has been laid in the street between the curb and the sewer trench), and the locomotive crane transfers pipe from the pile to the points where it may be needed. The least time required for going to the pile, picking up a pipe and carrying the same to and lowering it into the trench has been twenty minutes. Where the pipe crosses the Erie Railroad property, and also in the meadows, the pipe is supported on a pile foundation consisting of three lines of piles spaced 8 feet apart longitudinally and 4 feet 6 inches transversely, upon which are laid and drift-bolted 12x12 yellow pine stringers which carry a floor of 6x12 pine plank. On this platform and surrounding the pipe up to mid-height is placed concrete mixed 1:3:6, 11 feet in width. Under the existing railroad tracks this concrete is carried up over the top of the pipe, the reinforcing angle rings being here omitted, and 6-inch horizontal transverse I-beams are imbedded above the pipe at 2-foot intervals.



Expansion Joint, Steel Sewer.

Manholes are placed at 500-foot intervals along the sewer, and a similar number of Eddy automatic duplex air valves are used. Expansion joints are placed about 1,000 feet apart, of the common type shown in the illustration.

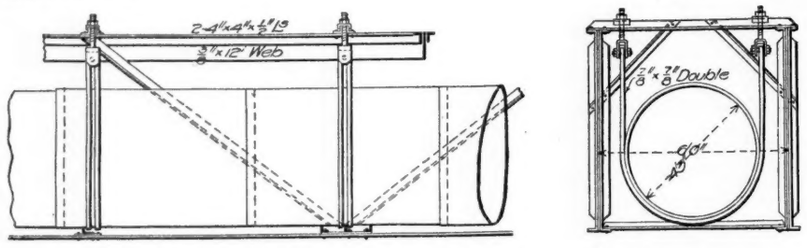
Another district of Jersey City known as Bergen District is also to be served with riveted steel storm sewer



Concrete Reinforcement of Jersey City Riveted-Steel Sewers.

outlets of various sizes. One of these will pass over the Newark and New York Railroad at Jackson avenue, for which purpose will be used a steel pipe 4 feet 5 inches in diameter. The street crosses the track at this point by a bridge, which, however, was not sufficiently strong or otherwise adapted to carry this sewer, and the sewer was therefore supported on a special bridge constructed under the cantilever sidewalk and resting upon the abutments of the highway bridge, with a span of 64 feet divided into eight 8-foot panels. It consists of two Pratt trusses 6 feet 4 inches deep and 6 feet apart, the pipe being hung from top struts by U slings of 7/8-inch square steel rods, which pass under the pipe and are adjustable by nuts playing upon their threaded ends, as shown in the illustration.

Mr. Charles A. Van Keuren, Chief Engineer of the Board of Street and Water Commissioners of Jersey City, designed and has supervised the construction of these sewers.



Side and Sectional View of Pipe Bridge, Jersey City Sewers.

Oiling Roads in Kansas City

"We are now experiencing the luxury of absolutely dustless roadways." This sentence occurs in a bulletin issued July 15 by the Board of Park Commissioners of Kansas City, Mo., of which Franklin Hudson is President, W. H. Dunn, Superintendent, and George E. Kessler, Landscape Architect. The bulletin is brief and to the point, and is as follows:

Our experiment with light residuum oil last fall proved entirely satisfactory as a dust-layer, and of considerable value as a protection to the pavements through the inclement winter and spring months, but was not of sufficient gravity or body to entirely accomplish the results sought. Upon steep grades it was objectionable on account of the roadway becoming somewhat slippery.

We began in May of this year, experimenting with the heaviest oil we could obtain in the Kansas Oil Fields, a residuum left after the distillates naphtha and kerosene have been removed, and is commercially termed "fuel oil," and grades about 20 gravity. We have contracted for this residuum at 80 cents per barrel of 42 gallons F. O. B. cars, Kansas City, Mo.

Two steel receiving-tanks, of 8,000 gallons capacity each, were erected near our track on the Belt Railway at Grove Street, at a total cost of $714.99, connected with a four-inch pipe-line from receiving-tanks to the side-track, permitting of unloading tank cars by gravity, the receiving-tanks being also established at such an elevation as to permit loading our sprinkling-carts by gravity from the receiving-tanks. Two portable boilers were purchased at $67.50 each, for the purpose of heating the oil in tanks and in sprinkling-carts.

When the macadam was absolutely dry and hard, the entire surface of the roadway was swept clean of dirt and screenings. The sweepings were left along the edge of the gutter for protection to the cement work, then the oil was applied from our sprinkling-carts. To our regular sprinkling-carts we attached a tin trough, perforated with quarter-inch holes, and thus obtained an even distribution of the oil. The entire surface of the roadway was flooded with oil and thoroughly broomed in, after which the sweepings from along the gutter, with sufficient limestone screenings to form a slight dressing, were cast over the oil and thoroughly rolled with a steam roller.

Since the 1st of May we have given one application of oil to practically all of the completed roadways, using for that purpose 120,477 gallons of oil, which covered 135,314 square yards of macadam pavement, and cost: For purchase of oil, $2,357.15; for labor and supplies, $3,202.68; total expenditure, $5,559.83. Or an average of 1 48/100 cents per square yard. A second application in September, it is estimated, can be made at a cost of not to exceed 1 cent per square yard, as less care will be required in preparing the roadway. It is probable that the application of screenings, after oiling, can be omitted. The second application, which we expect to make in September, should carry our roadway through the winter, and well into next season, in excellent shape, and at a greatly lessened expense for repair.

A good illustration of the protection oil gives to our roadways is shown by the heavy rain last night, when 4 2/10 inches of rain fell in four hours; from which we suffered no damage whatever, whereas our usual experience has been several days' work restoring roadways after such a rain. We are now experiencing the luxury of absolutely dustless roadways.

Accompanying the report are the data concerning the work done in May and June, 1907. The territory was divided into three districts named the North, South and Westport districts. In the first district 122,331 square yards were oiled, 39,398 gallons being used, costing $756.31. The labor and supplies cost $1,298.18, giving a total of $2,154.49, or 1.68 cents per square yard. In the Southern district, 117,770 square yards were oiled with 36,929 gallons, costing $737.93 for oil, $550.42 for labor and supplies, or a total of $1,288.35, or 1.09 cents per square yard. In the Westport district 44,150 gallons of oil were used on 135,314 square yards, the oil costing $862.91, labor and supplies $1,354.08, or a total of $22,016.19, or 1.63 cents per square yard. This is itemized for the various streets, and the total cost per square yard of these varies from 0.74 cents to 2.83 cents per square yard. It is stated that the high cost in the North district was due largely to the longer haul from the storage tanks. It is seen that the average amount of oil used was about one-third of a gallon to the square yard, and that the labor and supplies cost a little less than a cent a square yard.

A Use for Old Ferry Boats

Probably other cities can benefit by the suggestion given by the use to which New York has placed an old ferry boat retired from a municipal ferry line. This boat they have moored up at a dock at the foot of West Sixteenth street on the Hudson river, and are using it for a day camp for consumptives. The boat was placed at the disposal of the Committee on the Prevention of Tuberculosis of the Charity Organization Society, which thoroughly cleaned it and placed therein several dozen steamer chairs and a few cots, placed a trained nurse in charge, and provided a regular visiting staff of physicians. Patients are sent to the boat after being examined and passed by physicians, and each day go through a regular routine of weighing and temperature taking at 9 o'clock in the morning, remaining until 5 o'clock in the afternoon, except a few who stay all night. Each patient takes from three to eight eggs and from three to eight glasses of milk daily, any other food eaten being brought by the patients themselves. The Society stated that already marked improvement has been seen in the condition of great numbers of New York's 40,000 consumptives who have benefited by this fresh air treatment.

PAVING SPECIFICATIONS AND INSPECTION

Faults of Old Methods—New Methods Demanded by Modern Conditions—These Made Possible by Additional Knowledge

By FRANCIS P. SMITH, Ph. B.

SINCE the advent of the more modern types of pavements, especially those involving the use of asphalt, the necessity for efficient specifications and a careful system of inspection has become daily more apparent. With the increased competition and the very marked lowering in prices, an era of poor pavements was to be expected, and, in many instances, this expectation has been realized. How to meet the situation has been a problem which has caused no little anxiety to the majority of City Engineers.

In the early days of the asphalt industry the business was in the hands of a few large companies, who endeavored to stifle competition by securing the adoption of specifications that were more or less cunningly contrived to exclude the materials used by their rivals. City authorities, to whom this type of pavement was then almost wholly new, naturally were compelled to look to the contractor for their information in drawing up specifications. The result of this is plainly traceable throughout the entire country to-day, where certain provisions have been copied and recopied and slightly changed in an effort to amend them, which has frequently resulted in confusion worse confounded, and through all of which the original intent of unfairly limiting competition is plainly visible.

When but one or two asphalts of known composition and tried worth were available, it was comparatively easy to embody in a single set of specifications the ordinary requirements at that time considered to be all that were essential to the insuring of a good pavement. Even then, these requirements were largely farcical in their nature, as but few cities possessed the facilities for determining whether they were lived up to. The knowledge of the art was very limited and confined wholly to those who were connected with the industry, and no outside chemist was able to examine the pavements or the materials in such a way as to be of any benefit to the city authorities. Under these circumstances, it was natural that the requirements should be largely confined to specifying certain materials and prescribing in a general way, a very general way, how they should be used. It was also very generally felt that the provision calling for guarantee bonds was a blanket safeguard that could cover up a multitude of sins, and that absence of specific knowledge could be atoned for and guarded against most cheaply in this way. Such has not proved to be the case. Naturally, and legitimately if you will, no bonding company would assume an active liability without a clear knowledge of what it was doing and a close scrutiny of the provisions of its contract, to determine whether that liability could be enforced against it. This meant a lawsuit wherein the best technical talent was arrayed against the city, and any fault or looseness in the specifications was brought up as a reason why the bonding company should not be compelled to fulfill its liability. In the majority of instances the bonding company was successful in evading its responsibility and the city had no redress. A system of deferred payments has also been tried, but this again is not satisfactory. It increases the expense of the work to the contractor, which naturally falls back upon the city in increased cost of its pavements, and before it can be finally enforced the same procedure of lawsuits and close scrutiny of the provisions of the contract and specifications has to be gone through with.

Thus experience, bitter experience in many cases, has shown the futility of all these methods, and the remedy has been a difficult one to find. No safeguards, however well thought out in themselves, can be effective if any looseness exists in the specifications of which they form a part.

In these later days a more general, as well as specific knowledge of the art, has been acquired, and to a small extent some literature is available. To the experienced man who can sift out the truth from the mass of misstatements and advertising matter mingled with it, this literature, if diligently studied, will force home the conclusion that present methods of specifications and inspection are largely faulty, but long indeed must be his practical and intimate experience with the art before he can originate and apply the proper remedy for his own particular case.

With the knowledge that much depends upon the mineral aggregate of the pavements comes the knowledge that sands differ and the same mesh composition does not mean the same amount of bitumen and filler in the pavement in each case, even if the traffic in all cases remained the same. It is not too much to say that each particular type of sand must be studied individually. Subsoil, drainage, traffic and climatic conditions are equally important factors.

It behooves us, then, to examine into the practice of the best equipped paving companies, and it is undeniable that the same method should be followed by the City Engineer or whoever is responsible for the drawing up of the specifications. Some representative of the company examines carefully into the local conditions. He notes the kind and amount of the traffic to be met. Examines, or has examined for him, the different kinds of sands available in the neighborhood, and consults the records of pavements laid. If some of them have been notably successful, these are carefully examined and analyses made of them to determine their mesh composition and characteristics. With this mass of information duly accumulated and studied, he is in a position to determine just what sort of a pavement will successfully meet the local conditions, and makes his mixture accordingly. The smaller "hit or miss" man still makes his guesses and trusts to luck to pull him through, but this is a diminishing practice; nevertheless, one to be guarded against. With the asphalt contractor, long familiarity with the properties of the asphalt he intends using makes his task somewhat less difficult. The City Engineer is confronted with the task of drawing up his specifications, so that

they shall be equally effective and applicable with any kind of asphalt. Further than this, he must draw the line so that only suitable asphalts shall be admitted to competition, and in these days of special brands and residues from inferior oils and combinations, his task is a difficult one.

Certain of the larger cities are attempting to meet the situation by establishing laboratories of their own, and, where it is possible to obtain a trained expert to take charge of it, the results justify the expenditure. Where a man is appointed to such a position, with only the knowledge requisite to analyze the materials, the course of progress will be slow, for he must gradually and painfully acquire the practical knowledge of the subject before his results are of any great value to himself or others, as a means of guidance.

To the smaller cities this remedy is not open on account of the expense involved. What, then, is the true solution of the problem?

From an intimate acquaintance with the mining, refining and utilization of asphalt in paving, extending over many years, the writer firmly believes that the only solution is for each city to employ an outside expert who will work in conjunction with the City Engineer, and make the same careful examination of local conditions, available material, good and bad pavements that the large contractor does, and then frame up proper specifications in the interest of the city alone, with no hidden jokers or obscure provisions. Let these specifications not attempt to corral and classify all asphalts under one set of provisions, but let the necessary qualifications for each material be specified under a subdivision devoted to that material and its uses alone. While finality in the different kinds of asphalts suitable for use in paving has by no means been reached, certain universal requirements are generally recognized as essential, and these should be specified in all cases. The subject of new and untried asphalts is a very wide one, too wide to be fully entered upon in this instance, but a careful and unprejudiced examination by a competent authority will serve to classify these pretty conclusively as "good," "worth trying" and "worthless." Experiments on a small scale, under proper restrictions, can always be carried on, and if carefully watched and intelligently planned, will produce conclusive evidence as to desirability or otherwise.

This method of procedure has been carried on most successfully in Washington, D. C., except that this city has been able to have its own corps of experts, retaining these in many instances for such long periods of time that they have become fully familiar with all the intricacies of the art. The ends obtained have fully justified the means and probably no city in the country has such a large percentage of good pavements as has that city.

Properly drawn and enforced specifications, besides safeguarding the city, have another effect which is not always appreciated. Each contractor knows exactly what to expect and what he can and cannot do, and therefore bids with an exact knowledge of the cost of his work without having to make any provision for unknown contingencies. This puts the honest and reputable man, who is not willing to take chances in slighting his work, on the same basis as the shifty contractor, and not only results in lower prices, but tends to diminish the chances of success of the undesirable contractor.

With the question of specifications is indissolubly connected the question of inspection. Much that has been said regarding specifications applies with equal force to inspection. Present methods are faulty and to be condemned, yet the remedy for these must be gradually and intelligently applied. City officials, while recognizing existing defects, have not had the power to eradicate them. The old question of politics and political adherents to be provided for is always present, and invariably acts as a drawback to the best system of inspection that can be devised. Another wholly reprehensible practice is the placing of these inspectors on the contractors' payroll. Nevertheless, with all these drawbacks, some of which are difficult with present systems to wholly eradicate, much can be done to improve existing methods. Most of the present-day inspection is confined to the work done upon the street. While it is undoubtedly true that a good mixture may be ruined by improper handling upon the street, it is fully as important that inspection should be carried out in the paving yard. Chance exists at this point for substitution of inferior materials, overheating that is covered up before the mixture reaches the street, carelessness in the grading of the sand and the thousand and one other details of the manufacture of the paving mixture. This question of substitution and inferior workmanship is a natural sequence to lessened prices. The prices of sand and dust have not changed materially, and but little saving can be effected in that direction. When it is remembered that the average asphalt pavement of two inches in thickness contains twenty pounds of pure bitumen, which may represent a much larger quantity of asphalt cement, a saving of one-half a cent a pound, or ten dollars a ton, on his asphalt, would represent a saving of ten cents a square yard to the contractor. There is every inducement, therefore, to substitution on these lines, the very ones that are most difficult to detect without efficient plant inspection and expert laboratory control, beyond the ability of the City Engineer, *per se*, to enforce and maintain.

If it is necessary for a large concern to keep close track of its mixtures, is it not equally important for a city to do so? The necessary training for an inspector at a plant can be acquired in a short space of time if he is properly coached and sufficient laboratory control of the mixture sent out can be obtained at a small cost. Under such a system, how infinitely better safeguarded is a city? By retaining its own independent asphalt engineer in consultation with its City Engineer, together with a proper system of inspection and records, it will soon be in a position to definitely prescribe the mixtures to be laid upon the streets with the knowledge that these mixtures have been satisfactory in the past, upon which basis almost all the progress that has been made in the paving industry has been accomplished. It is no fault or confession of weakness that a City Engineer with his multifarious duties should admit that he is not qualified to act as a

paving expert. This branch of industry is one that requires years of experience before any man can justifiably pose as an expert, and all large undertakings of any kind have associated with them consulting experts in one capacity or another. One of the dearest commodities that a city can purchase is poor pavements, and the cost of securing efficient safeguards to that end is just as much a proper charge against the pavement as the material that enters into its composition. Suppose it cost two cents a square yard to properly supervise its construction; this is but a small proportion of its total cost, and it is a good pavement indeed that does not cost many times this for repairs during its legitimate lifetime. If a paving company needs its own expert, why does not a city need one doubly?

LAYING SUBMERGED SEWER

Twenty-inch Iron Sewer Outlet Jointed on Shore and Floated to Position—Tide Used to Assist in Work

At a meeting of the Connecticut Society of Engineers, Mr. W. S. Wardwell read a paper in which he described the method employed by him in laying submerged 20-inch sewer outlets in Long Island Sound.

Of one of these outlets one-half was laid above mean low water and the other half from mean low water to a depth of five feet below the same. The specifications called for making the joints of yarn and cold lead, well caulked, if the pipe was floated. The pipes which were laid singly in place were to have cement joints on top of a yarn gasket soaked in cement. "The problem presented was the laying of 1,000 feet of 24-inch bell and spigot pipe, weighing 139 pounds per lineal foot, upon a sandy bottom, the grade of which was considered true enough without preparation." Upon a stretch of beach about 1,000 feet from the site of the work, where the bottom was hard, fairly level and comparatively clean, at about three feet below mean high water, 504 feet of pipe were laid upon blocking, care being taken to have it level and straight. At his request, the contractor was allowed to use hot lead for the joints instead of cold, as he believed this would make a stronger construction; and all the joints of this pipe were poured and thoroughly caulked, as though to resist internal pressure, reliance being placed upon these joints for holding the pipes together while floating to position. Both ends were closed water-tight, and, as the pipes still lacked about 7 per cent. of floating buoyancy, 126 empty oil barrels were attached to the pipe in pairs. The disc used for plugging the off-shore end was of wood, and contained three 2-inch auger holes, plugged with ordinary pine plugs. When all preparations were completed, the barrels were fastened to the pipe as soon as the receding tide had uncovered it, a day being selected when there was little surface motion to the water and little prospect of wind. Eight rowboats had previously been attached at regular intervals by tow lines, and when the pipe had been floated off of its blocking it was towed to place alongside of guide piles, which had been driven to secure the proper alignment. It was realized that serious results might follow the formation of an air trap in the pipe when water was admitted, and it was consequently arranged to submerge the in-shore end before letting the air out of the out-shore end, the former being effected by removing the in-shore disc and the latter by use of the pine plugs previously referred to. Men were placed at regular intervals with axes to cut the barrel lashings, which was done at half tide, when there was 7 feet 6 inches of water at one end and 12 feet 6 inches at the other. The pipe reached bottom in just one minute, and when inspected by the engineer it was found unnecessary to make any alterations in it. For barrel lashings No. 4 steel wire was used, but for later work the author uses No. 6 B. & B. telephone wire, which is a stock article and stands twisting better. The wire was passed around one barrel, then around the pipe four times, then around the other barrel, an eye being left in each end of the wire, in one of which a ⅜-inch manilla rope was spliced. When the barrels were in position the hitches would be on top of the barrels and all on one side of the pipe.

The author believes that the success of this work was largely due to having the pipe straight and level, so that as the water rose the pipe rose altogether; to the strength of the joints; to the perfection of the lashings for the oil barrels; to the control of the air in the pipe, and to having men that can and are willing to swim. In a second outlet of 20-inch pipe practically the same method was employed, but the pipe was lowered more slowly, just enough barrels being cut loose to let it sink gradually, the remainder being released by a diver.

The author remarked incidentally that he had removed three abandoned submerged water-pipe lines, one of which had been down sixteen years, another eight years and the third one year, and in all there was a larger amount of sediment than is usually found in water mains, the 10-inch pipe being reduced to the capacity of a 6-inch. He suggested that some provision should be made for frequently blowing off submerged water pipe, to prevent the accumulation of such sediment. It is a question whether this would work as satisfactorily as the occasional use of a pipe-cleaning contrivance.

OIL BARRELS FLOATING IRON PIPE WITH A RISING TIDE

Telephone Franchise Provisions

THE provisions recommended by the Board of Estimate and Apportionment to be embodied in a franchise for a telephone company may be of interest and offer suggestions to other cities which are about to grant similar franchises. These provisions are as follows:

The franchise to run for twenty-five years with privilege of renewal for a second twenty-five upon revaluation by appraisers. The plant and property in the streets to become city property without cost at the termination of the grant. If real estate is taken it will be paid for at appraisers' valuation. The company to pay $250,000 in cash within thirty days of signing the contract; also annual payments during the first two years equal to one per cent. of the gross receipts, to be not less than $20,000; during the next three years two per cent., to be not less than $30,000; during the next five years four per cent., to be not less than $60,000; during the next five six per cent., to be not less than $100,000; during the next five seven per cent., to be not less than $150,000, and during the next five seven and one-half per cent., to be not less than $200,000. The compensation for renewal will be not less than for the last year of the first twenty-five. Free service for an unlimited number of telephones for the use of the city offices. No assignment of franchise without consent of Board. Company to sign contracts with other companies for long-distance service within six months. Construction and operation under control of all city authorities. Latest and best automatic system to be used, except where manual system is required to make connection with toll lines. Continuous service during twenty-four hours in each day. City subways must be used if they exist. Company agrees to sell subways constructed by it to the city at cost, less depreciation, and shall provide one three-inch duct for the use of the city. Permits for subway must be obtained, and plans of same furnished. Company to keep in repair, for a term of one year, all pavement removed, and bear cost of all inspections required and any changes necessary in subsurface structures. Privilege of constructing subways in streets shall be subject to the rights, if any, of owners of abutting property or others. Construction to be commenced in six months, and 33,250 telephones to be equipped and operating by the end of the first three years. Contract to be used in its entirety and not in connection with any other right or franchise previously granted. Maps to be filed with Board showing ducts and wires. Board may require extension of system and use of an improved system unless controlled by patents owned by other companies. Company to bear all expense of installation. Board reserves right to change and regulate rates. Maximum rates never to be exceeded so long as rate districts remain the same. No excessive deposit or advance payments to be required from subscribers. Unpaid bills never to be charged against property. Wires to be used for no other purpose than for telephones and never to be used for illegal purposes. Reports to be furnished weekly to the Police Commissioner, and Police Department permitted to examine instruments. Company to assume all liability to persons and property. Penalty for insufficient public service $100 per day; for failure to operate system for a period of two months, termination of franchise. Report to be made to the Comptroller of gross receipts and such other information as he may require, with right to examine books and officers of the company under oath. Company not to increase capital stock or bonded indebtedness or issue stocks or bonds without consent of Board. Reports to be filed annually with Board. Deposit of $50,000 required for faithful performance of contract. Comptroller to impose penalties. In case of violation of contract, suit may be brought by corporation counsel to forfeit. If authority of Board of Estimate and Apportionment or other officers is transferred, then succeeding Board or officer shall act for the city.

Electric Lighting Plant for Little Valley, N. Y.

THE town of Little Valley, N. Y., has under contract an electric lighting plant with a capacity of 4,000 incandescent lamps and 25 arcs. The plant contains one 150-k.w., 60-cycle, 1,100-volt alternator, an 8-k.w., 120-volt direct-connected exciter, and an 18-inch by 42-inch Corliss engine of 250 horsepower, all furnished by the Allis-Chalmers Co. The engine is to run at the comparatively low speed of 80 revolutions per minute, and carries a flywheel which weighs 14,000 pounds. This town already has a lighting plant, the engine of which runs at 265 revolutions per minute. The old plant will be retained in a serviceable condition, thus supplying them with an emergency plant.

Sewerage Assessments

THE Sewerage Committee of the town of Marblehead, Mass., has just published the reports upon a proposed sewerage system made by E. Worthington, C.E., and one by F. A. Barbour, Consulting Engineer, of Boston, Mass.; also one made in 1902 by Frank L. Fuller. The former, in discussing the subject of sewer assessments, presents an interesting table showing the methods employed by several Massachusetts towns in making such assessments:

TABLE SHOWING ASSESSMENTS FOR SEWERS IN MASSACHUSETTS TOWNS

Prepared by E. Worthington

TOWN	*Population in 1905*	*Proportion Assessed on Abutters*	*ASSESSMENTS*		*Depth From Street Line*	*Total Assessment Reduced to Front Foot*	*Rental Charge*	*REMARKS*
			Per Front Foot	*Per Sq. Foot of Area*				
Andover	6,813	¾	0.50	0.005	120	$1.10	.....	
Arlington	8,603	.....	0.28	0.0052	100	0.80	.....	Assessment fixed by act.
Athol	7,061	.....	.....	.....	.....	.....	$5 to $50	Rental.
Dedham	7,457	½	0.30	0.004	125	0.80	.....	
Framingham	11,302	.....	.....	.....	.....	.....	.....	Entrance charge, $15.
Gardner	10,813	½	.....	.....	.....	.....	.....	Entrance charge, $100.
Hyde Park	13,244	½	0.47	0.005	70	0.82	.....	
Medford	18,244	½	0.254	0.005	80	0.654	.....	
Melrose	12,962	½	0.20	0.005	100	0.70	.....	
Methuen	7,512	½	0.50	.....	100	0.50	.....	Frontage only.
Middleboro	6,885	.....	.....	.....	.....	.....	.....	Entrance charge, $25 to $50.
Milton	6,578	½	0.50	0.005	100	1.00	.....	
North Andover	4,243	½	.....	0.003	100	0.30	.....	
Orange	5,520	.....	.....	.....	.....	.....	.....	Town bears whole on tax levy.
Stoneham	6,197	½	0.48	.....	.....	0.48	.....	Frontage only.
Swampscott	4,548	.....	0.25	0.003	125	0.625	.....	Fixed by act.
Watertown	9,706	.....	.....	.....	.....	.....	.....	Town bears whole on tax levy.
Winchester	7,248	½	0.25	0.005	140	0.95	.....	

MUNICIPAL BOND SALES

Data Concerning Sales of Municipal Bonds During April by Cities of Less than 100,000 Population—Financial Statistics of Cities Listed

Name of City	Estimated Population	Actual Value of Assessable Property (estimated)		Ratio of ass'd to actu'l v'lue	Bonded Debt	Sinking Fund	Net Bonded Debt		Tax Rate per $1,000 Ass'd Value	Bond Sales, April, 1907				Basis
		Total	Per Capita				Total	Per Capita		Term of Years	Amount	Interest	Price	
Little Rock, Ark.	60,000	$46,250,000	$771	40%	$89,000	$49,600	$39,400	$0.66	6.00	4 avg.	30,000	6%	95.00	7.25
San Diego, Cal.	35,000	50,000,000	1,429	40%	1,207,350	.....	1,207,350	34.49	13.00	1-40 Ser.	70,000	4½% s.a.	101.971	4.354
											34,112	4½ " s.a.	101.66	4.376
											5,000	4½% s.a.	101.20	4.41
											151,933	4½% s.a.	101.42	4.394
											59,108	4½% s.a.	101.45	4.391
Ventura, Cal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,200	.....	100.25	.....
Fort Morgan, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30,500	6% s.a.	95.00	.....
Norwalk, Conn.	6,300	5,208,690	827	100%	580,000	57,217.84	522,782.16	82.98	8.50	20	75,000	4%	Par	.....
Rockford, Ill.	35,000	.....	.....	.....	.....	.....	.....	.....	.....	16	27,700	4% s.a.	100.036	3.912
Michigan City, Ind.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12,000	.....	106.812	.....
Latonia, Ky.	5,000	5,000,000	1,000	40%	15,000	7,000	8,000	1.60	12.50	5-10 opt.	1,500	6% s.a.	104.716	.....
Shreveport, La.	32,000	27,000,000	843	.....	337,000	10,485	326,515	10.20	17.62	39½	75,000	4%	Par.	.....
Bath, Me.	.....	.....	.....	.....	.....	.....	.....	.....	.....	4-12 ser.	90,000	4% s.a.	99.149	4.125
Clinton, Mass.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,000	3½%	90.57	.....
											4,000	3½%	94.50	.....
											8,000	3½%	93.38	.....
Gloucester, Mass.	26,121	21,699,042	830	75%	1,742,704	142,742	1,599,962	61.25	17.50	91-10 ser.	70,000	4½% s.a.	101.28	4.236
Viney'd Haven, Mass.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	95,000	4%	Par.	.....
Benton Harbor, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	30,000	4½% s.a.	102.00	4.349
Cheboygan, Mich.	8,000	3,500,000	438	70%	177,000	None	177,000	22.13	16.00	17-10 ser.	20,000	5%	103.19	4.73$
Farwell, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5-14 ser.	8,000	5%	101.25	4.842
Hillsdale, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	12,000	4%	Par.	.....
Ionia City, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5-14 ser.	20,000	5% s.a.	105.195	4.327
Lansing, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-5 ser.	42,000	5%	101.238	4.554
White Cloud, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5-20 ser.	8,000	5%	101.00	4.892
Wyandotte, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	24,000	4½% s.a.	100.55	4.466
Henderson, Minn.	.....	.....	.....	.....	.....	.....	.....	.....	.....	21-6 avg.	2,500	6%	Par.	.....
Gunnison, Miss.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	5,000	6% s.a.	Par.	.....
Jackson, Miss.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	50,000	5%	103.31	4.742
Savannah, Mo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35,000	.....	102.00	.....
Big Timber, Mont.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10-20 op.	40,000	6% s.a.	103.25	5.514
Aurora, Neb.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10-20 op.	43,000	4% s.a.	100.232	3.917
Papillion, Neb.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5-20 op.	18,000	5% s.a.	Par.	.....
Peru Bottom, Neb.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	20,000	6%	102.875	5.635
Sparks, Nev.	3,000	2,500,000	833	60%	None	.....	.....	.....	1.85	.....	40,000	5½%	103.502	.....
Asbury Park, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	.....	40	150,000	4% s.a.	Par.	.....
South Orange, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	.....	61-12 av.	35,000	5% s.a.	Par.	.....
West New York, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	200,000	5%	101.00	4.935
West Orange, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	142,000	4½% s.a.	Par.	.....
Auburn, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	7-6 avg.	140,000	4% s.a.	Par.	.....
Bath, N. Y.	3,800	2,540,000	669	80%	5,500	None	5,500	1.45	7.33	2¾ avg.	5,500	4½%	Par.	.....
Binghamton, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	7½ avg.	55,000	4% s.a.	100.025	3.996
Fort Edward, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-30 ser.	80,000	4.70%	100.031	4.697
Geneseo, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-20 ser.	20,000	4½%	100.13	4.484
Grand Island, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	9½ avg.	23,000	4% s.a.	Par.	.....
Lima, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	7⅞ avg.	15,000	4½%	100.066	4.48
North Pelham, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-8 ser.	12,000	6%	100.082	5.978
Perinton, N. Y.	6,000	3,000,000	500	100%	None	.....	.....	.....	4.56	1-20 ser.	25,000	4½%	100.04	4.495
Utica, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20-29 ser.	50,000	4%	Par.	.....
Utica, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10-20 ser.	25,000	4%	Par.	.....
White Plains, N. Y.	14,500	.....	.....	.....	1,397,060	.....	1,397,060	96.35	10.51	30	23,000	4½%	102.125	4.315
										30	3,000	4%		
Yonkers, N. Y.	68,000	60,019,750	881	.....	5,018,682	299,600	4,719,082	69.40	24.48½	9½ avg.	7,000	4½%	101.86	4.252
										9½	2,500	4½% s.a.	100.41	4.449
										42 1-12 avg.	11,200	4% s.a.	Par.	.....
Hickory, N. C.	5,000	2,600,000	520	50%	111,000	None	111,000	22.20	12.00	10	11,000	6% s.a.	103.28	5.514
Lumberton, N. C.	2,500	2,000,000	800	50%	25,000	4,000	21,000	8.40	11.10	10	25,000	5½%	100.80	5.546
Rowland, N. C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	12,500	.....	Par.	.....
Bellevue, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	8 avg.	7,000	5%	Par.	.....
Cadiz, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	8½ avg.	10,000	4½%	102.88	4.095
Canton, O.	45,000	60,000,000	1,333	30%	306,000	.....	306,000	68.00	32.00	1½ avg.	8,100	5%	100.49	4.543
										3 avg.	6,000	4½%		
										10	2,200	4%		
Delta, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 avg.	2,087	5½% s.a.	103.924	4.741
Fremont, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5-6 avg.	4,100	4½% s.a.	101.536	4.266
Girard, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	15-6 av.	30,000	4½% s.a.	105.14	4.058
Ironton, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	16,000	4% s.a.	102.00	3.855
Lancaster, O.	10,000	.....	.....	.....	.....	.....	.....	.....	.....	1½ avg.	11,217	5%	101.805	3.75
Lindsey, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15,043	5% s.a.	103.35	.....
London, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5-9 ser.	5,000	5% s.a.	105.055	4.16
Mansfield, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	61-6 avg.	57,400	4% s.a.	100.245	3.985
										1½ avg.	2,150	5% s.a.		
Martins Ferry, O.	.....	4,000,000	.....	.....	241,504	15,000	.....	.....	9.00	15⅝ avg.	20,000	5% s.a.	109.50	4.17
Mt. Vernon, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-10 ser.	3,000	5% s.a.	103.50	4.279
Mt. Vernon, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5¾ avg.	17,000	5% s.a.	103.50	4.357
Oak Harbor, O.	2,000	800,000	400	50%	17,500	2,500	15,000	7.50	31.00	21-12 avg	3,500	5% s.a.	Par.	.....
Paulding, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5¾ avg.	16,000	5% s.a.	102.00	4.508
St. Bernard, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-10 ser.	4,820	5%	103.143	4.351
Sandusky, O.	23,000	14,000,000	608	50%	640,000	10,000	630,000	27.39	16.92	20	8,000	4% s.a.	102.187	3.842
Sandusky, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	75,000	4% s.a.	100.67	3.94
Wadsworth, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	16 avg.	65,000	4% s.a.	100.23	3.98
Willoughby, O.	2,000	2,000,000	1,000.00	45%	78,000	2,400	75,600	37.80	2.80	5½ avg.	6,500	4½% s.a	101.538	4.184
Wooster, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	6-10 avg.	9,000	4% s.a.	Par.	.....
Youngstown, O.	60,483	56,882,000	940.45	50%	1,269,112	209,167	1,059,945	17.52	29.42	11⅞ avg.	55,000	4% s.a.	100.26	3.97
										3½ avg.	11,500	5% s.a.	102.74	4.09
										3½ avg.	8,290	5% s.a.	102.50	4.13
										3½ avg.	1,045	5% s.a.	102.39	4.20
										3½ avg.	365	5% s.a.	101.37	4.53
										5 5-6 av.	6,740	5% s.a.	104.63	4.13
										3½ avg.	19,000	5% s.a.	102.42	4.246
										12½ avg.	4,500	5% s.a.	100.77	4.522
										3½ avg.	5,340	5% s.a.	101.08	4.338
										3½ avg.	3,500	5% s.a.	100.23	4.022
										3½ avg.	2,505	5% s.a	100.07	4.058

(Concluded in next week's issue)

THE DISPOSAL OF MUNICIPAL WASTE

Systems and Methods, with Special Reference to American Conditions—Portable Crematories and Their Inventors—Summary of American Furnaces

By W. F. MORSE, Sanitary Engineer

This Series of articles, begun in the February, 1906, number, will be continued until completed and will be illustrated by original drawings, cuts, diagrams and pictures, and contain many tables valuable for reference.

The Subjects Already Treated by the Author Are:—

1. The Waste Collection Service in American Towns; Methods and Results.
2. Definition of Terms; Quantities; Proportions; Character of Waste in General.
3. Garbage; Analysis; Proportions; Values.
4. Dry Refuse and Rubbish; Quantities and Treatment.
5. Classification:—Commercial Values and After Recovery.
6. The Refuse Utilization Stations in New York, Boston, Buffalo, and Brooklyn (illustrated).
7. Municipal Ashes; Analysis; Proportions; Values when Separated.
8. Ashes from Cremation of Garbage; Analysis and Values; Comparative Table.
9. Comparison of Ashes from English and American Cities; Cremation Means.
10. The Utilization of Municipal Waste in General; English and American Methods.
11. Commercial Values of Refuse and Ashes when Marketed and Manufactured.
12. The Analysis of Garbage; Tankage; Its Value (Special Tables).
13. The Garbage Disposal Plant, Cleveland, Ohio.
14. Street Sweepings; Fertilizing Value and Treatment.
15. Comparative Commercial Values of Waste.
16. Foreign Destructors; Special Chapter by an Eminent Authority.
17. The First Garbage Cremators.
18. Official Reports on Cremators.
19. Chronological List of American Crematories from 1885.
20. List of Government and Institutional Installations.
21. Consolidated Tables of Installations; Hygiene and Sanitation.
22. Types of Furnace; the Operating American Furnaces (fully illustrated).
23. Portable Crematories (illustrated).
24. Summary of American Furnaces.

The Following Are to Appear:—

25. The Destruction System of High Temperature.
26. Calorific Value of Waste as Fuel (Comparative Table).
27. Reduction and Extraction Process Described and Illustrated; the Earlier and Later Methods.
28. American Methods; Col. Waring and His Successors.
29. Present Situation in This Country; Résumé.
30. Means for Improvement as Suggested by Several Investigators.
31. What May Be Expected of the Future.

Portable or Traveling Garbage Crematories

THE idea of a garbage cremator that should come to the premises, and not only take away, but destroy at once all useless matter, has been the dream of inventors. If such an apparatus could be made to work quickly, efficiently and without objectionable noise, odors, smoke or dust, there would be many advantages in its favor as against the prevailing methods of removal by collection carts. Some of the American cities have experimented with this form of garbage and refuse destroyer, but so far as known none are now employing a portable traveling furnace as a part of their disposal work.

The first American Portable Garbage Incinerator appears to have been invented in 1895 by H. C. Fellenbaum, of Philadelphia. Patent 546396, September, 1895. "The purpose of the inventor was threefold, to provide a compact, efficient incinerator which shall do its work without noise or noxious fumes, to so construct that it may be drawn or propelled to permit of the destruction as it is collected or while the apparatus is in motion, and to arrange the various parts of the apparatus so they shall be protected from injury by burning, bending or warping." There is a fire box of large capacity lined with fire-brick. Above this are horizontal tubes forming a steam boiler, and above this, on the outside of the boiler casing, an engine connected with the steam pipes of the boiler. At the front end of the boiler tubes is a sloping platform of water pipes arranged to pass liquid to a chamber below. Above this platform is a set of circular revolving cutters or knives, rotated by the engine, and above these knives is the hopper or bin for receiving the garbage. There is a hollow tube of large size extending through the length of the machine, which contains a screw to move the finely divided particles of garbage after passing the knives, drying the garbage in its passage and dropping it into the fire box to serve as fuel.

The smokestack is at the front end, and may be telescopic, to permit its being raised above windows of adjoining houses. The incinerator is presumed to generate steam for operating the cutting knives, for driving the conveyor, and for power for its own locomotion. Oil burners are placed in the fire box to begin the work or raising the initial steam; thereafter the dried garbage continues the operation. The front chamber below the boiler is a smoke box, in which all gaseous products are consumed or deodorized before passing to the stack.

This incinerator is a remarkably ingenious theoretical attempt to combine in a small compass all the various machinery and methods for chopping, drying and burning the garbage, for producing steam power for its own uses, and for destroying the products of combustion in such a way as not to produce nuisance. In practical use there are still some points to be dealt with, and it is possible that the claims for its continuous successful operation might not be realized. There is no record of trials or actual work performed.

The Apparatus for Treating and Cremating Garbage of Mr. Oscar D. McClellan, Philadelphia, patents Nos. 558974-5-6-7, April, 1896, include several novel and ingenious arrangements for the treatment of garbage by a tapering screw to press out the moisture, its drying for fuel, and the operation of a powerful vertical tubular boiler. The later patents describe another method of drying the garbage, the vaporizing of the moisture and the development of steam power for the work. These methods are described at great length, and seem to cover several theoretically successful ways of dealing with the

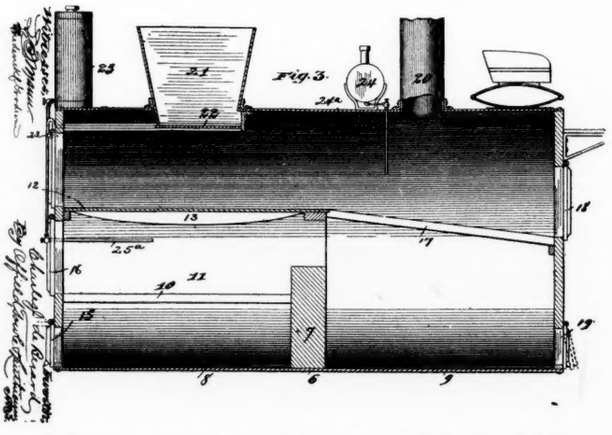


FIG. 65—C. J. DE BERARD TRAVELING GARBAGE CREMATORY

waste, but there is, so far as known, no reports or records of the apparatus being in experimental or actual service.

The Traveling Garbage Crematory of Mr. Chas. J. de Berard, of Chicago, patent 581686, May, 1897, was brought into actual use in Chicago in 1897-8. The purpose of the inventor was to provide means for the disposal of garbage, both dry and wet, of suitable construction and size, to be mounted upon wheels, and to be drawn through streets and alleys. The crematory, Fig. 65, is a circular iron shell, eight feet long, five feet in diameter. The lower part of this shell is divided transversely by the bridge wall (7) into two compartments (8-9), and above the first compartment (8) are placed grate bars (10) forming the primary fire box (11). Above this primary fire box is a horizontal diaphragm (12), strengthened by bars and flanges (13) to prevent warping. Below the primary fire box is an ash pit with door (15). Above the second compartment (9) is a second set of grate bars (17), inclined from front to rear, with a door (18) for moving the dried material from the floor (12). There is an ash pit below these grates with a door (19) for removal of ashes. The smoke pipe is directly above the last burning chamber of the bars (17). There are oil tanks (23-24) with openings into the spaces above the fire bars for assisting combustion. The garbage is charged through the hopper (21), which is controlled by a slide valve (22).

In operating this crematory the refuse and combustible matter is charged into the primary fire box, and furnishes fuel for drying the charge of wet garbage placed upon the drying hearth (12) above. When this charge is sufficiently dry to ignite it is pushed or pulled forward to the secondary chamber (17), and the combustion assisted by oil until it is reduced to ashes. All offensive odors are driven off while the garbage remains on the floor (12), and these mingle with the flames from the burning material on the bars (17) and are intercepted and consumed on their passage to the stack. This Berard crematory was used in Chicago for several months, and from the reports and criticisms of the daily press was successful in its work. It was discontinued early in 1898 and has not been employed since. Since there was no lining of fire-brick the iron shell must have been injured or destroyed after a short time. It is also doubtful if the methods for destroying the gases were altogether successful in this most important point of a portable furnace.

The Inventions of Mr. Isaac D. Smead and Smead's Traveling Crematory.—The inventions of Mr. Isaac D. Smead, of Toledo, now of Cincinnati, are among the most numerous in the line of sanitary appliances which deal with excrement and similar wastes. *The Smead Dry Closets* (patented 1891-2) was formerly in use at a great number of isolated buildings—mostly schoolhouses, and is still employed in places where no sewerage facilities are accessible. The *Smead Combined Crematory and Heating System* (patent 691328, May, 1902) is an apparatus for consuming garbage and refuse matter and applying the heat for the circulation of water for heating buildings. It is intended for uses of large buildings, is operated by using coal, and is ingenious and elaborately complicated in the arrangement of the working parts. The *Smead Garbage Crematory* (1902) was an amplification and extension of the ideas contained in the heater, and was experimentally tried on a large scale at Toledo. There is no record of the continuance of this crematory.

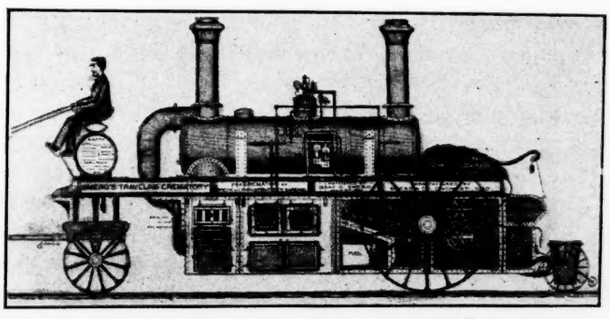


FIG. 66.—EXTERIOR VIEW OF SMEAD'S TRAVELING GARBAGE CREMATORY

The Smead Traveling Crematory, Fig. 66, is Mr. Smead's latest contribution to the long list of patents standing in his name. This first portable crematory was built for experimental purposes at Springfield, O., in September, 1905, where several trials were made dealing with the usual garbage and refuse collection. At a public exhibition, at which the city officials were present, a severe test was made with very wet garbage, which, according to the published reports, were quite successful. Subsequently the machine was brought back to the makers to be "tractionized" or made self-propelling. A second trial was made in February, 1906, but the city did not then purchase the crematory. Since then this crematory has been improved in several ways, and is now offered for the disposal of all classes of garbage, refuse and rubbish in competition with the other forms of stationary furnaces.

The Portable Rubbish Incinerator of the Street Cleaning Department of New York City

THE people of New York City pay but little attention to the ordinances forbidding the throwing of litter and refuse into the streets. What becomes of the newspaper, the parcel wrapper, the paper fruit bag, and the banana, orange and fruit rinds, nobody knows or cares, once they are thrown aside into the gutter. The cans for deposit of refuse are infrequent, being mostly placed at the park entrances and walks, and at the wider street intersections are not always available. The quantity of this refuse scattered about the streets is enormous in bulk and is one of the chief sources of trouble to the Department, as it must be swept up and held until the daily collection of the street cart.

The idea of burning this on the spot has long been entertained, but no serious attempt was made until February of this year, when there was brought into service a small portable furnace, described as follows by the inventor:

"*The portable refuse destructors* are formed from two wornout street cans, making a furnace by superimposing one on another. The lower one has a grate introduced above the bottom just far enough to leave a space for an ash pit. The sides of the can are perforated to allow of the admission of air necessary for the combustion. The upper can is inverted and fits to the lower, forming a dome, which prevents the escape of the fire in the lower one. This furnace is placed on the ordinary can carrier

now in use by the street cleaners and is fed by them as they patrol their beat, and the operation of disposal is continuous and effective. The resultant ash is placed in the ordinary street cans. When not in use these furnaces are stored at the sections and the carrier is used for its original function. The cans used measure 18 inches across the top and 16 inches to 21 inches high. The grate is placed 4 inches above the bottom. The perforations are in three rows around the can and above the grate, the top hole being 10 inches above the grate. The feed door is 8 x 10 inches. The capacity of the furnace is about two cartloads of rubbish per day and the resultant ash about one pailful. As the material is on hand the cost is only for labor, being the wages of two men at $4.00 per day, or $8.00, *i.e.*, $1.00 per furnace. The advantages of these portable destructors are obvious, as they clean up the rubbish that would otherwise be mixed in with the street sweepings and ashes. They also handle the litter on the street surface, and when the man has reached the end of his route there remains to be handled but a small quantity of ash. The first one of these furnaces was put in operation on Saturday, February 16. At this writing there are about 25 at work. The reports from the district superintendents, the section foremen, and also from the men who handle them are favorable, and it appears that this is a reasonable proposition and one that will save considerable trouble and add very largely to the sanitary state of the work of this Department."

In the practical use of this portable incinerator some points of difficulty developed which will probably cause its discontinuance in the present form. The furnace will keep up combustion without serious emission of smoke if fed continuously with small pieces of light paper, but will not burn fruit rinds or wood. When there is a large quantity of paper charged at once, then there is smoke, followed by flame and sparks from the top of the upper can. The expense of collection and feeding slowly is greater than the old method of sweeping and removal by carts. The slight thickness of iron soon warps and gives way under the heat and is not worth the trouble and cost of repairs. Since nothing but light paper and cardboard can be burned, there is left a large amount of other refuse which must be swept up and cared for in the usual way, making double work for the sweepers. During the late strike of the cart drivers of the Department these incinerators were of very considerable service, but could deal only with a small fraction of the total street refuse. Of the 25 built there are but few left at work, the number is not being increased, and at this writing the Department has decided not to continue their manufacture or use in this form.

The Portable Furnaces of the English Destructor Builders

The construction of portable furnaces has been carried on by the English builders, following in their main details one general form, but each builder adding such special features as are common to their own standard destructors.

The Meldrum Simplex Portable Destructor (Fig. 67) is perhaps one of the best examples, being specially designed for military camps and for sparsely-settled communities, where the cost of refuse collection and haulage to a central station would be excessive.

The destructor is a steel cylinder mounted on wheels and provided with large doors at the rear end for light refuse, with a smaller side door for wet offal. The grate surface of the fire box is as large as is possible and there is provision for obtaining forced draft from the steam boiler. High temperatures are maintained and there is a special apparatus for destroying the fumes of all combustion, as in the standard Meldrum furnaces.

There are two sizes manufactured, with capacity respectively of 500 and 1,000 pounds per hour, being the usual mixed, unsorted waste collections.

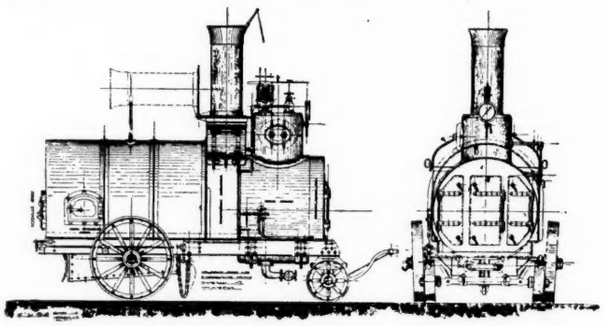


FIG. 67—MELDRUM'S PATENT PORTABLE REFUSE DESTRUCTOR

There is no record of the use of these portable furnaces continuously in municipal disposal work. Their chief purpose is the destruction of large amounts of light refuse produced by the temporary presence of considerable numbers of persons, where the cost of the regular service would be too great. In times of epidemic, when the occasion might arise for the prompt and effectual destruction of dangerous matters, a powerful portable furnace would be of great help to the sanitary authorities.

Since there is a boiler, raised to any desired pressure, there would be always a current of steam at high temperature to assist in the disinfection work, so necessary in times of emergency.

Portable Furnace Still Experimental

There is undoubtedly a place for a portable furnace, and within its powers it will be a useful adjunct to the other methods of municipal waste disposal. But it does not seem to have passed the first experimental stages of construction. Those that have been tried here have developed inefficiency in some essential point, or perhaps too much has been expected of them and too great claims made for their work. To burn large quantities of wet city garbage in a traveling furnace with a chimney necessarily low and to discharge the smoke and gases incompletely destroyed into the air on a crowded street would manifestly be an unwise, wellnigh impossible, task. Even the best and most powerful forms of furnaces are not always at their highest efficiency, and with the varying uncertain amount and character of usual city waste the results would not always come up to expectations.

But for light refuse there should be some form of furnace that can be pronounced practicable and satisfactory.

Present Record of American Furnaces

In the January, 1907, number of this journal, the list of American garbage furnaces compiled to that date was 184. Since then it has been noted that seven other crematories were omitted from the list, though all are of obsolete types and are discontinued, with one exception, and that three others of the original list are also abandoned.

But during this six months some thirteen installations have been contracted for, most of which are now under construction. Making these changes, there are now a total of 206 separate constructions built since 1885, of which 98 have been discontinued, a loss of 47.5 per cent., leaving 104, or 52.5 per cent., now in service.

Of these thirteen new plants two large installations are of the English Destructor type that destroy all forms of mixed municipal waste, developing steam power for uses of the towns or for private purposes, nine are cremators and incinerators built by four different American companies of a capacity of ten to fifty tons daily, one is for an army post, and one large furnace for a great railroad terminal. Besides these there are proposals pending for three army and naval posts and two others for cities of the fourth class.

With this number of these articles the description of American cremating furnaces is brought to a close. Did space permit, there might be added an account of many attempts to construct and operate garbage cremating disposal works, some of which were costly and ingenious experiments that barely failed of success. Others that simply implied stupidity and ignorance in the fundamental principles of the art, and still others that were built for the sole purpose of making a show to secure a contract.

Undoubtedly there will be still brought forward many forms of furnaces for this work that are destined to fail, and some that may achieve a success that will be permanent. The field is a wide one, the opportunities many, the necessity undeniable and the rewards great in promise.

But it must be remembered that with the experience of past years behind them with the assistance of expert engineers who are now turning attention to this neglected branch of municipal service, and with a better knowledge of what the several communities really need, the municipalities are not disposed to accept offers of furnace builders unless there be positive and reliable evidence of the capacity, durability, efficiency and sanitary operation of the forms of furnaces offered.

This evidence should not consist of the profuse and glittering statements of prospective builders, even though they be supported by flowery newspaper accounts of a trial made at the instance of and in the interests of the builder, nor the telegrams of a far distant city official whose knowledge comes solely from an employee whose place depends upon putting the most favorable aspect upon what is really a lamentable failure.

Nothing but an official record of costs and results over a period of at least one year should be accepted, and this should be verified by the personal inspection and unbiased report of a competent engineer of their own city, or from one whose knowledge of this branch of work includes experience and study of all the various forms universally used.

Only by a thorough, exhaustive examination of all the points involved can the town authorities be certain that they are securing the best and the most suitable apparatus for the particular work they want done.

Differences in Forms of Furnace Construction

When considering and comparing the various forms of garbage cremating furnaces, it will be seen that they may be divided broadly into two general classes or groups, the members of each group having many points in common, similar methods in operation, and all arrive at practically the same results in their general work. In each class there are some minor subdivisions, but none that depart widely from the distinguishing type.

The first class or group have the following distinctive points:

1. They are the crematories and incinerators that burn only garbage and refuse upon long horizontal garbage grate bars, either in single or double arrangement, and charge the waste through circular or rectangular openings in the roof.
2. They deposit the garbage upon the largest area of surface that the plan of the furnace will permit, piling up the largest quantity possible to charge without stopping the passage of the flames. In one form of furnace these bars are of hollow iron inclined from the middle line to the sides instead of being horizontal.
3. They consume the waste by heat applied from fuel boxes at one end, one side, or below the grates, and pass the heat over and under the masses of garbage, since it is practically impossible to force the passage of flame or heat through thick masses of wet household garbage.
4. For the purpose of stoking or stirring the garbage there must be a series of doors on the line of the grates, and below a second series for removing ashes. These doors admit large volumes of cold air, which must be heated to the temperature of the furnace interior before combustion can continue.
5. This operation of stoking causes moisture and unburned garbage to pass through the grates into the lower compartment, where it is slowly dried out until in a condition to burn. The evaporation from this moisture is not completed or destroyed until the secondary fire is brought to bear, and then only when this fire is at a temperature of 1,500° or above.
6. There is an average low temperature in all parts of the furnace except immediately adjoining or above the fuel box. The presence of moisture in masses of household waste over which the flames and heat pass to the chimney, the continual admission of volumes of cold air reduce the temperatures until the smoke and gases are not destroyed. In one experiment where an electrical pyrometer recorded the temperature the heat immediately behind the fuel box was 1,500 degrees, but decreased for each four feet of the garbage grate 300 degrees, finally leaving the burning chamber at 600 degrees in the shape of smoke and watery vapors taken up but not consumed.
7. There is always an imperative need for a secondary or smoke-consuming fire in the furnace itself or in immediate conjunction to reheat and reburn the incomplete combustion.
8. And it follows that fuel must be used in greater or lesser amounts to keep up the initial heat of the furnace fire and maintain the smoke and gas-consuming temperatures of the secondary fire.

These are practically the distinctive points in all the crematories and incinerators of this class or group, so widely used in this country. Reference to the preceding tables, illustrations and descriptions of American operating crematories will show the same principles of con-

struction and operation apply practically to all furnaces built for municipal service included in this class.

The great number of patents taken out, but not yet demonstrated in any practical way, have these same designs and methods as the basis of their work.

While there are some changes and departures from the main design, as for instance the use of the horizontal or inclined parallel grates, the upper being a drying hearth, and the lower described as a burning hearth, or where there are additional fire boxes for fuel to reinforce or reheat the smoke and gases at some point where higher temperature is needed, there is still adherence to the fundamental principles in form and methods of operating.

It is evident to those who have followed the initiation and development of this work that but little real progress has been made since the beginning of this movement. There have been great sums of money and time and labor expended, but the returns have not been commensurate with the outlay, for the builders have made no profit on their work; the towns have seen the installations fail in a majority of cases.

When this subject was discussed by the American Civil Engineers' Association in 1903* the following statement was made by the writer, and this is as true now as when recorded four years since:

"This question arose in England twenty-five years ago, long before it was thought of here. It began by the construction of the cell furnace, so-called, the Fryer Destructor, operating by the use of natural chimney draught, no forced draught being thought necessary. The results were almost identical with those obtained by the American furnaces of to-day. The temperature was low, offensive gases were thrown off notwithstanding the fume-cremator or secondary fire, and it was found expensive to maintain. No real progress was made until five or six years ago, when the furnace was shortened, forced draught introduced, the sloping platform made in such shape that the dried garbage could be used as a part of the fuel, and a combustion chamber added, behind which a steam boiler was placed."

Brooklyn's Municipal Asphalt Plant

The city of Brooklyn is now in possession of a municipal paving plant which has just been completed for the Bureau of Highways. The building containing the machinery is about 30x75 feet and the boiler and engine room about 12x15 feet, the whole being on a lot about 150 feet square. The plant was constructed by the Warren Asphalt Paving Company for contract price of $22,485, exclusive of the foundations, which were constructed by the Bureau of Highways. The plant is estimated to have a capacity of 270 cubic feet of surface mixture and 100 cubic feet of binder per hour, or about 1,500 square yards of finished pavement in eight hours. The building is a steel frame, the sides and roof being covered with galvanized corrugated iron and the floors are of reinforced concrete. It is therefore hoped that this plant will not be destroyed by fire, as has been the fate of so many. On the first floor are a dryer for stone and another for sand, each about 50 inches in diameter and 20 feet long. These are boiler-plate cylinders supplied with fire boxes for drying and heating the materials as they revolve slowly through the drums, are about 40 inches in diameter and have a slight pitch toward the outlet end, revolving about 20 times a minute. To insure the raising of the material and dropping it through the hot blast the drums are lined with longitudinal ribs. Materials are fed to the dryers by bucket elevators and when heated are discharged into another set of elevators which carry them to the top floor where they are stored in bins. The first floor also contains three cylindrical tanks for melting the asphalt, fire boxes being supplied for furnishing the heat and revolving agitators for properly mixing the ingredients. These tanks are kept under a pressure of about 9 pounds per square inch, which pressure forces the liquid asphalt up to the second floor through a 5-inch standpipe, from which it is drawn off into buckets from a stop cock. These buckets are carried on trolley tracks leading to the mixing boxes. The asphalt and oil are raised to the second floor in a barrel elevator, where they are deposited in the melting tanks in predetermined proportion. There are two mixing boxes, one for each class of mixture, consisting of metal boxes in which two sets of flattened teeth revolve in opposite directions at about 120 revolutions per minute. Scales with hopper attachments for weighing sand and stone are located over each mixing tank and under the third floor storage tanks where the hot materials are deposited. Sand for the surface mixture passes through a revolving screen on its way to the mixing box. The power for driving the various machinery is furnished by a 50-horsepower Erie engine and a 65-horsepower Star water tube boiler, except the agitators, which are operated by an 8-horsepower Sturtevant engine; while the air pressure for the melting tanks is supplied by Knowles 6x8x12 air compressor.

This plant was constructed under the direction of George W. Tillson, who was then Chief Engineer of the Bureau of Highways, Mr. John C. Gray having immediate supervision. The plant will be operated under the general direction of John C. Sheridan, Chief Engineer of the Bureau of Highways, but will be under the immediate direction of an experienced superintendent who will supervise the mixing of materials and have general oversight of the plant, and a foreman will have charge of all labor, tools and apparatus. The present plan is to maintain four gangs, each containing nine men and a foreman. An unanticipated difficulty is that of obtaining laborers, since these must pass the municipal civil service examination, and most of the laborers who have had experience in asphalt paving in Brooklyn and New York are foreigners who have not yet taken out their citizenship papers.

The object of this plant is primarily to maintain the million and a half square yards of asphalt paving already out of guarantee; but incidentally it is believed that it will insure more prompt repairs by the contractor of pavements in guarantee.

*Proceedings Amer. Soc. Civil Engineers, Jan., 1903. Vol. XXIX., No. 1.

NEWS OF THE MUNICIPALITIES

Divers Subjects of General Interest and Their Treatment by City Councils and Officials—Streets, Water Works Lighting and Sanitary Matters—Police and Fire Items—Government and Finance

Roads and Pavements

AKRON, O.—Paving work let to "would-be" contractors is given as the real cause of the poor condition of many of Akron's streets by Councilman Louis Seward. This statement was brought about by a discussion of the condition of South Main street, where the soft bricks have broken up and the street is in bad condition. Explaining further, he stated that many contracts have been let to would-be contractors who have bid so low that legitimate firms could not compete with them. Whether a system of inspection cannot be devised that will overcome this difficulty is a matter that interests the Service Board.

ATLANTA, GA.—A good roads bill has been prepared by Senator J. M. Boyd. According to the bill surveys of public roads will be made between county sites. The grading will proceed, beginning at the court house and proceeding to the county lines; macadamizing contracts will succeed the grading. To provide funds, a tax of $2.50 per $1,000 will be levied and turned into a State Public Road fund. A civil engineer will be appointed to supervise the work.

DAYTON, O.—The Milk Commission of the Montgomery County Medical Society has addressed a letter to the public calling attention to the poor quality of milk supplied in Dayton, and stating that the Society has undertaken the work of inspection. An examination of the ordinary milk sold in the city showed from 280,000 to 34,280,000 bacteria to the cubic centimeter. It is stated that not a single dairy supplying milk to Dayton could market its milk in any city where high standards are maintained. The Milk Commission will provide for two grades of milk, inspected and certified, the latter conforming in all respects to the highest standards.

DETROIT, MICH.—The Detroit United Railway is carrying out the improvements suggested by Mayor Thompson to the Common Council several months ago. At that time the Mayor had a list prepared of all sections, however small, showing the exact condition of the company's tracks. Since that communication came to the office of J. J. Haarer, Commissioner of Public Works, the company has made repairs in nearly a dozen streets. It has a gang of nearly 200 men out on the streets repairing tracks and pavements.

EAST ORANGE, N. J.—A petition signed by thirty-one residents of Munn avenue, asking for the discontinuance of the use of asphalt oilene, has been presented to the City Council. It is set forth that the results of the work so far done have been unpleasant and costly. After the lapse of more than a week since the first application puddles of oil are still to be found on the street. The oil and dirt is tracked on walks and piazzas by dogs and cats. Tradesmen delivering goods track the dirt into kitchens. Postmen and lamp lighters continually crossing the street contribute to the defacement. Visitors not familiar with the condition of the street, cross it, and carry dirt into houses. The whole appearance of the street is disgusting.

HARRISBURG, PA. — Officials of the State Highway Department state that it is their intention to use brick more generally in the construction of the new stretches of State roads than has heretofore been the custom. There have been a large number of requests from the farmers for roads of this character, and while a few have been constructed, they have never generally come into use. Tests, however, have shown that those constructed and in use for some time are in far better shape than clay and macadam roads in the same section, and that the saving on horses and equipment is great. The clay roads in Western Pennsylvania become almost impassable in the winter and spring, a fact that is the means of causing great loss to the farmer depending on the roads to haul his early product to market.

TOPEKA, KAN.—City Attorney F. M. Drenning has filed suits against Hanley & Ritchie, paving contractors, for an alleged overpayment in an estimate allowed by the City Engineer. The sum of $650 was claimed for extra work performed in repairing an intersection which was damaged by the passage over it of a large machine. The attorney claims that the various amounts should have been presented in detail and the kind of work specified, and the bills then presented to the Mayor and the Claims and Accounts Committee, and finally to the City Council. Instead, the extra charges were charged in the sum total for paving, as a certain number of yards at the contract price. The attorney says that the including of sums for extra work in this manner is an assumption of the duties of Mayor and Council by the Engineer.

WATERBURY, CONN.—The Commissioners of the Board of Public Works have instructed the City Attorney to bring suit against the Connecticut Company to enforce it to observe the orders of the Board in the matter of draining the center of its roadway. Many complaints have been caused by the ruining of clothes from mud and grease spattered from the pools of water in the track after rains or after sprinkling. Accordingly the company has been ordered to provide inlets to drain the water into the sewers, but has failed to do so.

Sewerage and Sanitation

AKRON, O.—Akron has developed an excellent specimen of an inspector who does not inspect and a contractor who thought he liked that sort of an inspector. While drawing money as an inspector, the gentleman referred to was engaged in laying cement walks by contract in some other part of the town. The sewer contractor at that time was busily employed in setting bricks in mud, presumably having a better use for cement. Although not very much of the sewer, which is three feet in diameter, has been laid, it is more than likely that it will not remain in place. The work is so bad it will probably all be taken up.

AUSTIN, TEXAS.—State Health Officer Brumby is planning a sanitary campaign with special reference to the condition of public buildings. Having received an opinion from the Attorney General defining public buildings, he will require the placing of screens in police stations, jails, boarding houses, hotels and State institutions. Owners of office buildings will not be required to screen their windows and doors, but they will be required to disinfect their buildings to the extent of sprinkling the floors with disinfectant before sweeping.

BALTIMORE, MD.—A statement prepared by Chief Engineer Calvin W. Hendrick, of the Sewerage Commission, shows the amount of work done or under contract up to July 20, as follows: Sanitary sewers completed, 15,686 feet; storm water drains, 26,517 feet; total completed, 42,203 feet. The total length under contract, in feet, is: Sanitary sewers, 53,314 feet; storm water drains, 82,833 feet; total, 136,147 feet. The value of contracts let

to date is: Sanitary sewers, $1,839,456; storm water drains, $527,667; disposal and pumping plants, $614,104. Besides these expenses, land to the value of $329,143 has been purchased.

Columbia, S. C.—Mr. George M. Whitten, of the Dairy Division of the Department of Agriculture, at the City Council chamber delivered a timely address on milk and how to keep it free from impurities. Mr. Whitten came by invitation of Mayor Gibbes and Alderman Du-Pre. His lecture was especially interesting, in view of the recent agitation for a Meat and Milk Inspector. In the pure food law there is a section referring to milk, and upon this portion of the statute Mr. Whitten talked at length. In this connection he pointed out to the dairymen the best ways of keeping and operating a dairy farm, and at the same time impressed upon the dealers the serious results that will follow the selling of milk that is unfit for use.

Jersey City, N. J.—The construction of a new sewer in Twelfth street, near the water front, is being retarded by the presence of an old sewer which it was intended to avoid. The old sewer, however, was found to be crooked, and not in the center of the street, as the plan showed. The sewer is forty years old, and besides being out of place, is out of order, the lime or cement in the joints having been destroyed by salt water. As forty years is about the life of a brick sewer exposed to sea water, the new work was not begun any too soon.

Peabody, Mass.—The town of Peabody has turned its sewage into the trunk sewer along the North river basin, and it is expected that in a very short time the process of cleansing the North river will commence. The canal is clogged with the accumulations of years and may have to be dredged so that the stream can purify itself. Probably if nothing is done the stopping of emptying sewage into the river will allow the stream in time to cleanse itself, but to obtain any immediate relief the whole canal will have to be cleansed at once.

Water Works

Columbus, O.—The following extracts from the diary of J. F. Hill, who has charge of the patrolling of the Scioto river water shed, show why the city water is impure. The extracts are memoranda of the finding of dead animals: April 2, four sheep, badly decomposed; April 4, ten sheep; April 5, dead horse; April 17, dead dog; April 25, several dead chickens in river; April 26, dead horse, dog and hog; May 3, hog; May 8, two sheep; May 9, sheep and horse; May 10, sheep and dog; May 11, dog; May 15, three horses and two dogs; May 16, three horses; May 17, horse; May 22, one horse, six sheep; May 24, horse skeleton, hog; May 25, thirty-five chickens; May 30, two hogs, several chickens; June 6, four hogs; June 25, dog.

Fort Worth, Texas.—Recent demands on the water works have been so heavy that it has been necessary to pump river water into the mains in addition to the regular artesian supply. The sources of supply have been considered insufficient for some time, but no agreement has been reached as yet as to whether it is best to try to develop the artesian supply further or to build filters and reservoirs for river water.

Louisville, Ky.—The city was almost without water July 23 owing to the breaking of a section of the 48-inch main that conveys water to the Highlands. This is the fourth break that has occurred in the line of the 48-inch mains in a period of ten days. The pressure in the mains was increased to 100 pounds to the square inch. The 20-inch main, put in in 1859, the 30-inch main, laid in 1869, and the 36-inch main, installed in 1877, stood the pressure. The 48-inch broke once from a defective casting and three other times from causes not determined. Chief Engineer Hermany states that the new main was thoroughly tested, and he does not understand why it should not stand the strain.

May's Landing, N. J.—Dedication exercises were held July 26, in honor of the completion of the new water works plant. Bands and fire companies from surrounding towns took part in the ceremonies, which consisted of a parade and a public meeting. The water works cost $25,000. The stand pipe is 110 feet high, receiving water from an artesian well 227 feet deep, and distributing it through a system of pipes five miles long.

New York, N. Y.—New York has the greatest supply of water on hand in its Croton system within the history of the city. Without a drop of rain or the fall of a flake of snow between now and March 1, 1908, the city would have an ample supply of fresh water to meet every emergency. This supply is stored behind the new Cornell dam in the Croton valley. The total amount of water in storage is about 67,000,000,000 of gallons. The average daily consumption of water in the city is 325,000,000 gallons.

Reading, Pa.—Owing to the bad condition of water recently in the parts of the city that do not receive filtered water, the Council has decided to extend the filtration system so as to include the whole city supply. This will require an expenditure of $500,000, to provide which an issue of bonds requiring the consent of the voters will be necessary.

Street Lighting and Electric Power

Bath, N. Y.—The Bath Electric Light and Power Company has been unable to agree with the officers of the village in regard to the renewal of the present contract for street lighting, which expires in October. The company objected to terms in the contract requiring that once each year a trial be made of all day commercial service. Although the Village Trustees advertised for bids none were received. Mayor A. E. McCall recently returned from Buffalo with Messrs. De Groat and Tower, who offered to furnish 75 arc lights for $62.50 a light a year, all night service. Moreover, they agree to maintain an all-day service every day in the year, with a sliding scale of rates, the maximum being 12 cents per kilowatt hour.

Duluth, Minn.—According to the semi-annual report which the Manager is preparing, the city's gas business has increased greatly. During the first six months of the current year the surplus earnings of the department were $23,000. This is the first time there has been a surplus of any consequence during the first half-year and it is believed to indicate annual surplus earnings of $60,000, as compared with $47,000, $27,000 and $19,000 for each of the preceding three years. There has been a great increase in the use of gas for fuel purposes, over 100 gas stoves per month having been sold by the Department and one stove company.

Fargo, N. D.—The City Council has passed a conduit ordinance providing that all telephone and telegraph systems and all wire systems, except electric light and street railway, shall, within certain limits, practically the business district of the city, be placed under ground, and shall be so located as not to necessitate digging up paving to make repairs or extensions.

New York, N. Y.—Attorney General Jackson has filed formal exceptions to the findings of Special Master in Chancery A. H. Masten in the action to have declared as confiscatory the 80-cent gas law. Exceptions are taken to the following findings: That natural appreciation must be considered in fixing the amount invested in plant and property; that the value of the franchises of the company should be considered, it being alleged that it is inequitable to the gifts of the city; that the cost of gas production is 65.84 cents per 1,000 cubic feet, it being alleged that the figure should be 52.50 cents.

PLAINFIELD, N. J.—Mayor Charles J. Fisk, with other city officers and representatives of the Public Service Corporation, recently made a night tour of inspection of the street lights in automobiles. The object of the trip was to ascertain the exact condition of the street lights. Nearly four hours were taken up in the trip. Only one light was found to be out—that in front of the residence of one of the civic societies. Many lamp shades were found to be very dirty, and in some sections of the city the lights were completely hidden by a dense growth of trees. As a consequence of the investigation, an order will be issued requiring the cleaning of all shades every fifteen days.

Fire and Police

JERSEY CITY, N. J.—The Police Board has decided upon an important change in the method of keeping the record of the prisoners arrested. The card index system is to be used in order that it may be possible to trace, in a few moments, the arrest of any person regarding whom information is desired. Under the present system no index is kept, and to secure a record of arrest entails a vast amount of searching through blotters and other books of record. Unless the date of the arrest is known, it is impossible to find the record desired without scanning every name until the right one is reached. Under the card index system this will be so simplified that to trace an arrest will be the work of but a few moments. All arrests made hereafter will be indexed by this system, and the records of the past two years will be revised and re-entered on the cards.

LONDON, ENGLAND.—The river side frontage of Battersea Park was recently the scene of the annual parade of the London Fire Brigade. The force turned out was eight steam fire engines, two motor steam fire engines, four horsed escapes, motor hose tender, four vans, two fire floats, with tug and raft with 204 officers and men. These were representatives of the Council's seventy-six stations, with their equipment of 93 engines and 1,306 officers and men. A handsome silver cup, given for the smartest average time of turning out, was awarded to the Burdett Road fire station, the average time being 27½ seconds.

NEW YORK, N. Y.—As the result of a letter to the various heads of departments, asking that as many specially detailed policemen as could be spared be returned to him for patrol duty, Commissioner Bingham has been able to get together 200 additional men for patrol duty. Most of these men were old and hardly able to do patrol duty. The Commissioner thinks there are a number of young men holding soft snaps in the Street Cleaning Department, the Board of Health, the Police Courts and other branches of the city government, and as soon as they are found out they will be returned to patrol and the old men put in their places.

PERTH AMBOY, N. J.—Fire Chief Eugene C. Mullen wants the truck now used by the Protection Company to be sent out to the suburbs. He says the truck is a disgrace to the city; it has one extension ladder fifty-five feet long, very clumsy, which most of the firemen have tried in vain to operate; it takes five or ten minutes to raise it anyway, and when elevated it is likely to fall at any minute. As there are a constantly increasing number of three-story buildings in the city, a new, up-to-date truck is much needed.

Government and Finance

BOSTON, MASS.—Councilman Pierce has announced that he will introduce a bill next year to compel the Mayor of Boston to keep a record of his acts, which shall be accessible to all citizens for inspection. In pointing out the necessity for such a bill, Councilman Pierce says: "The Mayor has increased an unusual number of salaries and there is no way for either the public or the members of the City Council, who, I feel, should in a matter of this kind have even greater privileges than the public, to ascertain just what the Mayor has done."

INDIANAPOLIS, IND.—Before acting on Mayor Bookwalter's application to allow the city to use a portion of the Court House grounds for a new City Hall, the County Commissioners will take an informal vote in order to ascertain the popular opinion. It is not their plan to hold a special election, but to place in the Court House one or two voting machines, in charge of a clerk, and allow the voters thirty days in which to register their views.

LOS ANGELES, CAL.—The city will attempt to collect taxes from the Western Union and Postal Telegraph Companies by a new form of assessment. Hitherto these corporations have escaped taxation upon local property, on the ground that they operated under a Federal franchise. The City Assessor this year, however, has levied assessments against their occupancy of the streets, assessing the Western Union $100,000 and the Postal $50,000, exclusive of their personal property holdings, and the companies have started injunction proceedings.

NEWCASTLE, PA.—Steps, looking toward a modification of the present form of city government, were taken when the Councils appointed a committee to confer with City Solicitor Gardner. The change suggested is the creation of a Board of Public Works of three members, who shall be known as Commissioners. They are to be considered as executive officers of the Councils and city government in the performance of all administrative and ministerial duties not conferred upon any other official. It is proposed that the Commissioners shall have an annual salary of $1,500.

NEW YORK, N. Y.—A bill has been passed by the Legislature and approved by the Governor permitting Comptroller Metz to sell New York City bonds at a private sale if they remain unsold after a public sale. Owing to the failure to sell its bonds, the city has been without funds which it could use to pay contractors.

PHILADELPHIA, PA.—When work was stopped on the Philadelphia filtration contracts of the McNicol firm, all sorts of charges of poor work were made, and a large sum of money held back. Finally an arbitrator was selected to go over the work and settle the controversy. He recently handed in his decision that the city owed the contractor $2,000,000. The amount was promptly paid. The arbitrator also found that while one of the members of the firm was a member of the City Councils he received $51,000 as his part of the profit. This sum he has directed be returned to the city. The general character of the work was found to be in accordance with the specifications.

ST. PAUL, MINN.—Taking advantage of a law passed by the Legislature at the last session, Comptroller Betz has offered $135,000 4 per cent. sewer bonds for sale by popular subscription. The first day brought an offer from a local bank for $50,000 and several offers for smaller amounts from individuals. Many inquiries were also made. This is the first time that St. Paul bonds have ever been offered over the counter, and the plan seems a success.

Refuse Collection and Disposal

BALTIMORE, MD.—It is now the intention of Mayor Mahool to have the city do the work of collecting the garbage, but to let out the contract for the disposal of the same. The contractor, it is expected, will purchase the disposal plant of the Sanitary Company, which must be taken over by the city temporarily, and will re-erect it somewhere outside the city limits, the contractor being

required, under the specifications, to remove the plant at least five miles from the city. If no satisfactory bid for the disposal of the garbage alone is received the Mayor expects to advertise for a contractor who will do just what the Sanitary Company has been doing—that is, both collect and dispose of the garbage. If no satisfactory bid is rceived under the second set of specifications, then the city will undertake to do all the work itself.

Bridgeport, Conn.—Public Works Director Biltz has made arrangements for flushing all the paved streets of the city once a week. For the present the work will be done with a fire hose. The Director wishes to have a flushing machine purchased as soon as possible, so as to avoid damage to the streets from the use of the hose.

East Orange, N. J.—The city has been conducting an investigation regarding systems of garbage disposal, and will probably erect a crematory. At present the city scavenger has a contract to collect all household waste, and, besides, collections are made by about a dozen scavengers. The ashes are disposed of sometimes at a profit in filling low lands. The refuse, not including garbage, is taken to the dumping grounds, valuable articles sorted out, the rest spread on the ground and covered with ashes. Garbage used to be disposed of on the dump, but the Board of Health stopped that, and now the scavenger hauls it to scows which are dumped at sea. For this work a lump sum is paid, probably amounting to $1.50 a ton.

Harrisburg, Pa.—At a special meeting of the Sanitary Committee, at which six members—less than a quorum—attended, it was decided to accept the invitation of the Davis Incinerating Company to visit Lancaster, where the company maintains a plant. For the first three years of its existence the city operated the plant; during the last two years it has been operated by the company.

Joplin, Mo.—An individual garbage crematory is being operated by a citizen of Joplin in his back yard. He has built a brick oven about three feet wide, five feet long and three feet high. He places all his garbage and refuse in the oven, dries it with a slow fire, and then burns it. Whether or not he has been able to avoid the nuisance of smoke and danger of fires from sparks is not stated.

Philadelphia, Pa.—The results of an investigation of the cost and disposal of ashes show that Philadelphia pays the highest price of any city in the country—68 cents a cubic yard. Other figures obtained in the course of the inquiry are: Cleveland, 45 1-2 cents a yard, formerly 71 cents; Buffalo, 31 cents. Milwaukee is reported to pay $150,000 annually for the work and is contemplating a contract system by which the work may be done for $50,000.

St. Joseph, Mo.—Numerous complaints are being received daily relative to the alleged inattention of garbage haulers. Scavengers take contracts for the removal of garbage by the month. Difficulty is experienced in forcing haulers to carry out their agreements. The first week of service, it is said, is satisfactory. The second and third develop a laxity in many instances. Waste matter remains in tin cans exposed to the hot sun. A new hauler is appealed to and, the complainants state, with no better results. The reason given by the garbage haulers for quitting their contracts is that there is a great scarcity of teams and teamsters, and that other work is much more remunerative to them than hauling refuse.

Scranton, Pa.—A sub-committee has presented to Council their outline and estimate of a plan for collection of ashes and garbage disposal. In the tour of investigation the members found that the collection of ashes costs more than the collection of garbage, especially when the latter work is done by contract. They recommend a complete system of ash and garbage collection entirely by the city; also an issue of $100,000 bonds to cover the cost of installing a plant, purchasing a suitable site, erecting a barn and buying equipment for collection. An annual appropriation of $50,000 is considered sufficient for operation.

Worcester, Mass.—Complaints are frequent about the failure to collect garbage promptly. The work is in charge of the Overseers of the Poor, who complain that their funds are insufficient to do the work required at this season. The eight-hour law, which recently went into effect, is also blamed. It is claimed that this alone has cut down the efficiency of the department by 50 per cent., as shown by comparison of the records with those of a year ago. Increased appropriations and a reorganization of the department are contemplated.

Parks and City Beauty

Baltimore, Md.—Mayor J. Barry Mahool has received notice that the Federal Government is now ready to turn over to the city for park purposes Fort McHenry and the surrounding grounds. The Government reserves the right to resume possession at any time and it stipulates that the present buildings shall be allowed to remain standing. The fine prospect of the river and harbor makes this an exceptional location. It is suggested that a historical museum should be established and that the original Star-Spangled Banner that inspired Key's stanzas should be kept there. The State historical exhibition now at Jamestown, Va., would form a good nucleus for a larger collection.

New York, N. Y.—After considering plans submitted by the New York Connecting Railroad for its proposed East River bridge, a committee of the Municipal Art Commission has disapproved of them, holding that the bridge is loaded down with decorative features, which are neither appropriate nor artistic.

A bill signed by Gov. Hughes recently authorizes the extension of Riverside Park by filling in land under the waters of the Hudson between 114th and 116th streets, so as to permit the construction of a water gate and monument to Robert Fulton, the inventor of the steamboat.

Ogdensburg, N. Y.—In response to an invitation, Charles Mulford Robinson has submitted a report for the improvement of Ogdensburg to the City Council. He states that improvements, in addition to beautifying a city, should promote its business interests. With this end in view he advocates the preservation of the beauty of the river front. He advocates an immediate investment in the neighborhood of the ferry entrance. A bridge at Lafayette and Spring streets can be made an attractive park feature, as well as eliminate a grade crossing. A rearrangement of parks and squares, the parking of water works property, and the care of trees, are advised. Electric wires should be buried. A system of small parks and playgrounds should be located and the sites acquired. Residential streets should be parked.

Peoria, Ill.—Park Engineer C. E. Dunn has completed plans for the magnificent sunken gardens which are to take the place of the stagnant pool at Glen Oak Park, adjoining the West property. They will have an area of two acres, will be six feet below the general level of the park and ten feet below the level of the privet hedge which will surround the gardens. The center piece will be a magnificent fountain surrounded by a balustrade, with ornamental posts surmounted with Catalpa Bungei trees, in tubs. The designs as shown by Mr. Dunn are beautiful in the extreme. The terraces will be ornamented with festoons, and graceful and beautiful designs, including a huge American flag, will be traced on the green in flowers. The grading is nearly complete, and

the sodding will be finished this fall. When finished the gardens will be the finest feature in the park.

ST. PAUL, MINN.—B. H. Schriber has submitted a novel proposition to the Park Board, and the opinion of Corporation Attorney Michael will be asked. Residents along Fairmount Avenue are desirous of having established a building line to prevent the erection of buildings in any block nearer to the curb line than any building now standing in the block. There is a house line law, but Mr. Michael has held that the law is ineffective. Mr. Schriber told the board that while he had not investigated the matter thoroughly he was under the impression that the Park Board may, under certain provisions of the City Charter, condemn and take an easement in property for light and air for park purposes. That is to say, the board may condemn a light and air easement which would take in twenty feet within the property line, the property not going to the city as in other condemnations, but allowing the Park Board to keep the buildings back that distance.

WILKES-BARRE, PA.—Wealthy and public-spirited men, who have become interested in the work of creating public parks and playgrounds, have donated the city considerable valuable land. George S. Bennett first gave a large plot near the center of the city for a playground. Abram Nesbitt gave a number of acres of heavily-wooded land opposite the center of the city, on the west bank of the Susquehanna. The Levi S. Shoemaker heirs gave eight and a half acres adjoining the Nesbitt tract. John Wells Hollenback has just given a 75-acre tract north of the city, formerly known as surburban park.

Rapid Transit

HUNTINGTON, IND.—One of the most striking advantages offered by the new high-tension service on the Ft. Wayne and Wabash Valley lines is the improvement of the lights in the cars at night. This is very noticeable since the new plan has been adopted. But even under the present arrangement the light is not satisfactory, and probably it never will be until storage batteries become low enough in price and light enough in weight for it to be practical to use them on interurban cars.

NEW YORK, N. Y.—An application was made to the Public Service Commission by the Continuous Transit Securities Company for the privilege to build a subway under Broadway from Fourteenth to Forty-second streets and to equip it with a continuous train or moving platform railway. The moving platform would require a right of way of only 35 feet, although its capacity would be twice as large as a four-track subway. The proposed platform would afford a seating capacity exceeding 47,000 passengers an hour in each direction. This is three times the seating capacity of a train system operating five-car local trains upon one-minute headway, and practically six times the seating capacity of a system of surface cars operating upon 150-foot headway.

PHILADELPHIA, PA.—The directors of the Rapid Transit Company have taken the first steps toward carrying out the partnership agreement between the city and the company, made through the adoption of the retail merchants' plan for better transit facilities, when they decided to issue a call for two payments of $7.50 each on each share of the company's stock, thus making it full-paid, in accordance with the agreement. As there are 600,000 shares of the stock outstanding, the first payment will make available in September $4,500,000 for work on the subway and for general construction and betterment of transportation facilities, with an equal sum in September of next year. "The city is now a partner in the Rapid Transit," said Mayor Reyburn, "and the city will be of assistance to the management of the Transit Company in every way possible. The police, for instance, will be given instructions to aid the movement of cars, especially in the downtown districts. In case of blocks they will be expected to aid in removing the cause, and often a little authority will be of great benefit in the operation of the cars."

RICHMOND, IND.—Incensed at the dilatory tactics of the Terre Haute, Indianapolis and Eastern Traction Company in failing to maintain the roadway between its tracks in proper condition, the City Council has had an ordinance drawn up declaring the franchise granted to the Richmond Railway Company, under which the Traction Company operates, forfeited. By the urgent advice of City Attorney Study the Council did not pass the ordinance at the third reading, but agreed to wait two weeks for the Traction Company to act. It is stated that President Hugh J. McGowan of the company has promised to remedy the defects, but his superintendent failed to do the work.

SOUTH BEND, IND.—After a long controversy, the city has made an agreement with the Chicago, South Bend and Northern Indiana Railway Company that all interurban cars shall enter and depart from the city over the tracks of the local railroad. This decision was the result of a trip to Indianapolis, where a similar agreement is giving satisfaction. The company agrees to furnish tracks and terminal facilities for any new interurban line for 2½ cents for each passenger in or out and 50 cents per car mile for each baggage car.

TOLEDO, O.—A clause prohibiting the crossing of Toledo streets at grade will be inserted in the franchise which has been asked for by the Lima and Toledo Traction Company. The franchise is to be perpetual, and says nothing about rates of fare or the question of having interurban cars stop at street intersections in the city to take on or let off passengers.

Miscellaneous

ALBANY, N. Y.—Mayor Gaus has signed the ordinance organizing a Commission to investigate the cost of acquiring the water front. The Commission will be composed of seven members, four of which will be appointed upon nomination by civic societies.

PHILADELPHIA, PA.—The engineering staff of the Bureau of Surveys takes pride in the fact that when the falsework for the new Walnut lane bridge was removed some days ago the immense span, which is the largest concrete span in the world, settled but a sixteenth of an inch, when they had allowed for a change of three-quarters of an inch.

PITTSBURG, PA.—The first report of the Smoke Inspector has just been made. Since June 15, it is reported, 442 plants have been visited and promises of co-operation were obtained generally. The effect is said to be already apparent in the mill section. Huge stacks that formerly emitted clouds of black smoke night and day now seem to be idle. A closer look, however, shows that a thin gray cloud is drifting away with the wind. No prosecutions have taken place; the whole work has been done by "moral suasion."

ST. PAUL, MINN.—A system of renaming the streets will be presented to Council by Postmaster Edward Yarrish. At present there are 1,031 streets in the city, the names of which do not in any way tell where the streets are located or which way they run. Although the proposed system has not been fully developed, the idea is that Wabasha and Rice streets shall be taken as the east and west dividing line, and in the business section of the city the river should be taken as the north and south line. The north and south streets are to be called avenues and designated by letters of the alphabet. The east and west streets are to be called streets and designated by numbers.

REVIEW OF THE PERIODICALS

Abstracts and Synopses of Important Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading United States Periodicals

Safeguarding Milk Supplies

The articles on "Pure Milk for Cities," which were printed in the June magazine and here reviewed, have been followed by further articles on the same subject in the July magazines. The fact would seem to indicate a fortunate arousing of public interest in the subject, along with a promise to arouse it further. The July articles add little, however, to the definite and satisfactory discussions that were presented in June. They are written more obviously for popular reading than to offer information and suggestion to city officials. Day Allen Willey, in the July *Van Norden's,* attempts to cover, superficially, the whole subject. The most valuable contributions of his article are a quoted statement from Dr. Goler, the Health Officer of Rochester, N. Y., telling briefly in his own words the story of the remarkable pure milk campaign in Rochester, substantiating the story as it was told here a month ago, and a statement, also quoted, from Professor H. W. Wiley, Chief of the United States Department of Agriculture's bureau of chemistry. This is a reminder that action can be taken, under the National Pure Food law, against any person shipping, or delivering for shipment, to New York impure milk from New Jersey, Pennsylvania, or Connecticut, or receiving such milk in New York. This, of course, applies as well to any other city—as Philadelphia, for example—so situated as to receive part of its milk supply from other States than its own.

The article in the *Metropolitan Magazine* for July is by Carrington A. Phelps, and is an interesting and very complete popular account of the many steps through which the milk supply passes before it gets within the city limits. The case taken is that of New York, and in the description of the far-scattered dairy farms hundreds of miles from the city, of the collection of the cans in small groups at wayside stations, for milk trains on branch roads that in turn deliver the cars to the trunk lines, and of the many temptations to carelessness and adulteration, there is well revealed the great difficulty and complexity of the problem of safeguarding the milk supply of a large city. What New York does, by inspectors, is also described. The writer gives, finally, a wise and timely warning of the added danger when pasteurization is undertaken but is done insufficiently.

Dogs as Policemen

IN giving an account of the use of dogs in Ghent as an auxiliary to the police force, Gustave Abel, of that city, contributes an interesting and valuable article to *The Independent* of June 27. The success of the experiment in Ghent has led to this use of dogs in towns throughout Belgium, in parts of Paris, in a hundred and fifty German towns, and at least one American—South Orange, N. J.

The population of Ghent is 170,000; its area 6,400 acres. There was need of considerably increasing the police force and a lack of funds. Accordingly, Mr. Van Wesemael, the police superintendent who had been giving the subject much thought, asked for dogs. He began with three. There are now thirty, which are considered the equivalent of sixty men. The cost of keeping them amounts to between five and six cents apiece a day.

A full and interesting account is presented of the training and of the work that the dogs do. It is arranged that each dog shall always watch the same section, with the same officer, going on duty at 10 P.M. and remaining until 6 A.M. The animals not only protect the policemen, but they are quick to detect crime and to pursue and attack the criminal. They also instill such terror and respect that crimes are fewer, while the discovered criminal scarcely makes effort to escape or to fight. Shepherd dogs are used, and the training—which is most complete—seems to be easily given.

A City Rebuilt

The advertising value of city beauty, and the practical measures taken to secure it, are the interesting features of an article in July *Van Norden's,* by Reo Bennett, which he entitles "A Dream City Realized." The city described is Rio de Janeiro, the extensive improvements in which have been lately the theme of many a magazine article and illustration—a circumstance, by the way, that in itself gives a proof of civic æsthetics' advertising value. Mr. Bennett says: "The beautifying of the city and the building of a splendid system of dockage is directly and consciously part of a deliberate plan formed by the Brazilian government to develop the resources and the commerce of the country. Rio de Janeiro is to be made a show place of the Western Hemisphere because the government of Brazil intends that it shall be a great permanent advertisement of Brazil's resources and commercial possibilities. . . . . Spending $200,000,000 in beautifying a city as advertising is a novel method, but if it is true that the Rothschilds are loaning the bulk of the money and overseeing the expenditure, the rest of the world can take it for granted that this is good advertising."

As to the method of procedure, the author declares: "When it was decided to make of Rio de Janeiro a city so beautiful that the wealthy of other parts of the world would be attracted thither and thus spread the facts of Brazil's wealth world-wide, the matter was gone about in a business-like way." There was given out no information to invite extortionate demands because the municipality would be purchaser. "The loans were negotiated, ready for placing. Then the federal Congress placed in the hands of Mayor Passos and the other gentlemen

who were to have charge of the rebuilding of the city some unusual powers. They were empowered to condemn property and to establish an equable system of valuing the property condemned. Things were done with the same speed that a private firm or corporation would regard as necessary. For instance, the Avenida Central, a mile and a quarter long, was cleared, paved, the buildings upon it constructed, lighted with electricity, and opened for traffic in eighteen months." The value of seized property was based on the taxes that had been paid. In Rio de Janeiro these taxes are apportioned to the rentals. Occasionally a "best," or prominent, citizen arranges with his tneants for a nominal rental and a bonus, in order to reduce his taxes. No mercy was shown in such cases. The Mayor looked only at the tax books, and the courts upheld the procedure as fair.

And, now, as to what has been done. A magnificent municipal Opera House, a National Library, and a National School of Fine Arts are among the public buildings put on the central avenue. Along the curving shore of the bay, the Biera Mar, a wide boulevard beautifully parked and with a sea-wall promenade, four miles long, was also laid out and built. Other streets were paved and widened, and whole districts of squalid tenements were torn down. At one place, where one of the city's hills added no beauty and made traffic inconvenient, the hill was cut away. The city has been provided with a new sewerage system. Under the auspices of a new Department of Health a sanitary corps works as ruthlessly as the Mayor. Rio de Janeiro has also undertaken some minor "socialistic" enterprises, notably the expenditure of $600,000 in model homes for laborers. There is also a great system of docks. A stone quay 10,600 feet long, with a channel 910 feet wide and 30 feet deep, and the most modern warehouses and apparatus for handling cargo from shore to ship, form an undertaking to be completed at a cost of $42,000,000. This is met by a tax of two per cent. on the imports.

New York Transit Developments

The story of the great efforts now going forward to provide adequate facilities for passenger transportation into and out of New York City, is told by Walter Prichard Eaton in the *American Magazine* for July, with more than usual popular interest, impressiveness and completeness. It has been said that New York is to expend for its new water supply as much as the Panama Canal will cost. For the tunnels out of the city and the railroad termini the expenditure is twice as much as that. The meaning of it all, as the writer graphically states, is that the town, too full of human beings to hold any more, is bursting. For the purpose of the tunnels is not so much to shunt people into New York as to get them out of it. The Pennsylvania "station building will cover 25 acres (almost twice as many as the South Station in Boston). It will accommodate a traffic of 400,000 a day, so in one year the entire population of the United States, Canada and Mexico could pass through it without jostling." This new terminal will have facilities to get out a train every 24 seconds. The station for the McAdoo tunnels "will be able to handle 600,000 people a day, or more than the entire population of Baltimore." Then there is the vast undertaking of the New York Central system, and there are the several tunnels under the East River. It is a story of marvelous developments, which in a very short time must vastly change New York.

Conquest of the Interurban Trolley

Indiana's successful experiment with the interurban electric car, as an effective weapon with which to secure good service and equitable rates from the steam roads, is the thesis of an article by Merrill A. Teague, "Emancipation by Trolley," in *Appleton's* for July. "Seven years have passed," he says, "since the Indiana public went earnestly at this gigantic task. Yet to-day there is not so much as a pretense of competition with the people's railroads. Except in the matter of heavy, bulky freight, transportation in the most densely populated part of the State is now carried on by the trolleys. . . . One thousand miles of track are in operation; 350 miles are building and will be placed in operation early this year; another 2,000 miles are projected; every steam railroad out of Indianapolis has been paralleled; more than fifty million dollars have been invested actually in these railroad properties; passengers are carried at their convenience in clean and comfortable cars, and for one-half the former fares; parcel and parishable freight goes forward to its destination most expeditiously and at reasonable charges. . . . At Indianapolis the terminal facilities are superior to those provided by the steam railroads. A ten-story building in the center of the shopping district contains the general offices of the companies. Back of it is a great train shed sheltering eleven tracks, and beyond are the freight warehouses. The ground floor of the terminal structure is given over to a union ticket office, to waiting rooms and lavatories for men and women, and to a great concourse. All the trolleys entering Indianapolis arrive at and depart from this terminal; trains are called by megaphone, and tickets must be shown at the gate before passing to the tracks. The farmer now runs into town and back within the hour. He no longer has to lose a day when a machine breaks down. A quick trip to the nearest town, a telephone message to the repair depot, and the part is forwarded by the next car. His light marketing is made simple and easy; and his children go now by trolley into the nearest town." As to the freight business, now rapidly growing, "the rates are the same as those of the steam roads, but the service is much quicker. The statement is frequently made that the companies furnish express service at freight rates." But this business is yet in its infancy, and is a small factor compared to the passenger transportation. All of this is very interesting; but the query that naturally suggests itself, and which the article does not touch upon, is why have not the Indiana steam roads bought up their trolley competitors, as has been so generally done in the East—notably by the New York Central and New York and New Haven systems?

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Periodicals Listed Below

Acetylene Journal, Chicago.
Ainsley's Magazine, New York.
American Academy of Political and Social Science, Annals, Philadelphia.
American Architect, New York.
American Banker, New York.
American Gas Light Journal, New York.
American Homes and Gardens, New York.
American Institute of Architects, Bulletin, New York.
American Institute of Electrical Engineers, New York.
American Magazine, New York.
American Society of Civil Engineers, Proceedings, New York.
Appleton's Magazine, New York.
Architects' and Builders' Journal, Baltimore.
Architects' and Builders' Magazine, New York.
Architectural Record, New York.
Architectural Review, Boston.
Arena, Trenton.
Associated Engineering Societies, Journal, Boston.
Atlantic Monthly, Boston.
Brick, Chicago.
Broadway Magazine, New York.
Canadian Municipal Journal, Montreal.
Cement, New York.
Cement Age, New York.
Century, New York.
Charities, New York.
Clay Record, Chicago.
Clay Worker, Indianapolis.
Collier's Weekly, New York.
Construction News, New York.
Consular-Reports, Washington.
Contract Journal, London.
Cosmopolitan, New York.
Country Life in America, New York.
Craftsman, New York.
Department of Labor, Bulletin, Washington.
Eclectic Magazine, New York.
Electrical Railway Review, Chicago.
Electrical Review, New York.
Electrical World, New York.
Engineer, Chicago.
Engineer, London.
Engineering-Contracting, New York.
Engineering and Mining Journal, New York.
Engineering Magazine, New York.
Engineering News, New York.
Engineering Record, New York.
Engineering Review, New York.
Engineering Soc'y of West. Penn., Pittsburg.
Engineering World, Chicago.
Engineers' Club, Proceedings, Philadelphia.
Everybody's Magazine, New York.
Far Eastern Review, Manila.
Financier, New York.
Fire and Water, New York.
Fireman's Herald, New York.
Forum, New York.
Franklin Institute Journal, Philadelphia.
Gardening, Chicago.
Gesundheits Ingenieur, Munich.
Good Roads, New York.
Harper's Monthly, New York.
Harper's Weekly, New York.
House and Garden, Philadelphia.
House Beautiful, Chicago.
Illuminating Engineer, New York.
Independent, New York.
Indian and Eastern Engineer, Calcutta.
Insurance Engineering, New York.
Iron Age, New York.
Journal of Accountancy, New York.
Leslie's Weekly, New York.
Literary Digest, New York.
Local Government Journal, London.
McClure's Magazine, New York.
Manufacturers' Record, Baltimore.
Metropolitan Magazine, New York.
Moody Magazine, New York.
Municipal Engineering, Indianapolis.
Municipal Journal and Engineer, New York.
Municipal Journal, London.
Municipal World, St. Thomas, Ont.
Munsey's Magazine, New York.
New England Water Works Ass'n Journal, Boston.
North American Review, New York.
Outlook, New York.
Pacific Monthly, Portland, Ore.
Pacific Municipalities, Santa Clara, Cal.
Park and Cemetery, Chicago.
Pearson's Magazine, New York.
People's Magazine, New York.
Popular Science Monthly, New York.
Power, New York.
Preventive Medicine Journal, London.
Progressive Age, New York.
Public Health, London.
Public Service, Chicago.
Putnam's Magazine, New York.
Review of Reviews, New York.
Revista Municipal, Havana.
Rock Products, Louisville.
Sanitary Institute Journal, London.
Scientific American, New York.
Scribner's Magazine, New York.
Smith's Magazine, New York.
Street Railway Journal, New York.
Suburban Life, Boston.
Success, New York.
Sunset, San Francisco.
Surveyor, London.
Technique Sanitaire, Paris.
Times Magazine, New York.
Tradesman, Chattanooga.
Travel Magazine, New York.
Van Norden's Magazine, New York.
Village, Hyde Park, Mass.
Water, London.
Water and Gas Review, New York.
World To-day, Chicago.
Western Municipal News, Winnipeg.
World's Work, New York.

ROADS AND PAVEMENTS

Tar on Roads. Discussion. By R. W. Cass. 1 p. The Surveyor, June 21.

Tar Macadam, Notes on. Paper before Municipal and County Engineers. By C. F. Wike. 1 p. Contract Journal, July 3.

Tar Preparations for Road Purposes. Description of recent English test. 1-2 p. Municipal Journal and Engineer, July 3.

Tarmac Roads in England. Description of this kind of construction. 1-4 p. Municipal Journal and Engineer, July 31.

Petrolithic Pavement, Specification for Constructing. From report of the Department of California Highways. 1 p. Engineering-Contracting, July 24.

Tar Spraying Trials, Notes on. Paper before Municipal and County Engineers. By Fred. W. Pearce. 1-2 p. Contract Journal, July 3. 1-2 p. The Surveyor, July 5.

Stream Pollution from Road Tar. Experiments of R. Aglio Dibdin. 1-2 p. Municipal Journal and Engineer, July 24. The Surveyor, June 28.

Dust Suppression. General popular article. By F. H. Leeds. 1 3-4 pp. The Surveyor, July 12.

Dust Laying Problem. Paper before Association of Cleansing Superintendents. By F. W. Brookman. 1-2 p. Local Government Journal, July 20.

Minimizing the Dust Nuisance; Construction of Roads for This Purpose. Paper before Institute of Sanitary Engineers. By Thomas B. Simmons. 1 p. Contract Journal, July 17.

Calcium Chloride, Applications to Roads. English arguments for and against. 1 p. Good Roads Magazine, July.

Asphalt Paving Industry, Recent Progress in. Paper before Society of Chemical Industry. By Clifford Richardson. 2 1-2 pp. Engineering-Contracting, June 26, July 3.

Asphalt Paving Company's Plant. Description of visit to Trinidad Lake Asphalt Paving Company's Plant. By Incorporated Association of Municipal and County Engineers. Illustrated. 2 pp. Contract Journal, July 17.

Municipal Asphalt Plant for Brooklyn. Description of plant recently completed. Illustrated. 2 1-2 pp. Good Roads Magazine, July.

Patents on Bitulithic Pavements, Suits for Infringement of. Letter from Warren Bros. and reply from E. K. Coe. 1 p. Engineering News, July 4.

Brick Pavements. Methods of Laying. Illustrated. By A. S. Atkinson. 2 1-2 pp. The Clayworker, July.

Paving Brick, What Constitutes a First Class. Paper before Illinois Clay-Workers' Association. By W. P. Blair. 1 1-2 pp. Good Roads Magazine, July.

Concrete Pavements. Brief description of those at Richmond, Ind. 1-2 p. Concrete, July 15.

Concrete Roads. Description of the Hassam method. By Walter E. Hassam. 2 pp. Pacific Municipalities, June.

Sidewalks, Monolithic Cement. Article advocating these. 1-2 p. Municipal Journal and Engineer, July 10.

Impact Test for Road Material. A new machine described in paper before American Society for Testing Materials. By L. W. Page. 1 1-2 pp. Engineering Record, July 6.

Cost of Paving in Seventeen United States Cities. Compiled from papers in Annals of American Academy of Political and Social Science. 1-4 p. Municipal Journal and Engineer, July 10.

Paving Contracts and Payments. Synopsis of papers published by American Academy of Political and Social Science. 1 p. Municipal Journal and Engineer, July 3.

Back-Filling Trenches. Mechanical ramming and reinforced concrete. 1 1-4 pp. Municipal Journal and Engineer, July 31.

Poorly Tamped Trenches. Illustrated description of result from. 1-4 p. Municipal Journal and Engineer, July 31.

Construction and Maintenance of Roads. Paper before Municipal and County Engineers. By Thomas Aitken.

2 pp., The Surveyor, June 28. 1 1-2 pp., Contract Journal, June 19.

Automobiles Injure Roads. Abstract from report of James H. MacDonald, Connecticut State Highway Commissioner. 1-2 p. Municipal Journal and Engineer, July 24.

Road Requirements. Paper before Municipal and County Engineers. By E. P. Horley. 3 pp., The Surveyor, July 5. 2 1-4 pp., Contract Journal, July 3.

Road Requirements of the Future. Paper before Municipal and County Engineers. By John S. Brodie. 1 1-2 pp. Contract Journal, July 3.

Notes on Macadam. Paper before Municipal and County Engineers. By C. F. Wike. 1 p. The Surveyor, July 5.

Climate and Geology, Effect on Highways. "The King's Highway." By Reginald Ryves. 2 1-2 pp. The Surveyor, June 21.

Good Roads, Making and Keeping in Repair. Popular article. By Henry Douglas. Illustrated. 1 1-2 pp. Suburban Life, August.

Street Pavement Development. Brief history and formula for calculating cost of maintenance. Paper before Franklin Institute. By George W. Tillson. 4 1-2 pp. Engineering-Contracting, July 17.

SEWERAGE AND SANITATION

Sewage Disposal by Biological Processes. Paper before Engineering Conference, England. By John Duncan Watson. 1-2 p., Engineering News, July 25. 1 p., Engineering Record, July 27. 1 p., Water, June 15.

Sewage Disposal at Caversham. Illustrated description. 1 3-4 pp. The Surveyor, July 12.

Sewage Disposal at Hanley, England. Illustrated description. 4 1-2 pp. Water, June 15.

Chemically Treated, Settled and Septic Sewage. Comparison of their action on oxidizing beds. Paper before Institution of Civil Engineers. By George Adams Hart. 1 1-2 pp. Water, July 15.

Percolating Filter at Greetland. Illustrated description. 3-4 p. Municipal Journal and Engineer, July 10.

Stream Pollution Decisions. Abstract of a judicial review contained in recent Oklahoma Supreme Court decision. 2 1-4 pp. Engineering Record, June 29.

Putting Sewage in Rivers and Bays, the Folly of. "Polluting the Waters." Editorial. 1-2 p. Collier's Weekly, June 29.

River Flushing Tunnel and Pumping Station. Diluting the polluted Kinnickinnic River, Milwaukee. Illustrated. 2 pp. Engineering Record, July 27.

Flushing Sewers. Periodic vs. automatic flushing discussed. 3-4 p. Municipal Journal and Engineer, July 10.

Sewage Pumping at Salem, Mass. Description of Electrical Pumping Plant. 1 3-4 pp. Municipal Journal and Engineer, July 31.

Sewerage Pumping Station of Chicago. Description of new Thirty-ninth Street station. Illustrated. 6 1-2 pp. Power, August.

Sewer Ventilation. Defects and proposed solution of present methods. Paper before Association of Municipal and County Engineers, proposing an almost absurdly complicated system. Illustrated. By Isaac Shone. 4 pp. Contract Journal, June 26. 9 pp., The Surveyor, July 12.

Sewer Air, Data Concerning Pollution of. 1 1-4 pp. Public Health, July.

Spontaneous Ignition of Sewage Gas. Statement of occurrence of this in Mississippi. By Prof. W. P. Mason. 1 p. Journal of New England Water Works Association, June.

Cost of Brick Sewer Construction. Detailed statement of cost of Thirteenth-street sewer, St. Louis, including tunnel. 3-4 p. Engineering-Contracting, July 10.

Sewer Construction, Cost of Trenching, Pipe Laying and Back-Filling. Cost at Laurel, Miss., given in great detail. 4 pp. Engineering-Contracting, July 24.

Riveted Steel Sewers in Jersey City. Illustrated description of some now under construction. 1 p. Engineering Record, July 13.

Reinforced Concrete Sewers. Illustrated description of two French systems. 3-4 p. Municipal Journal and Engineer, July 24.

Storm Water Discharge Calculations and Designing Sewage Details. Paper before Municipal and County Engineers. Illustrated. By E. E. Wallington Butt. 6 pp. Contract Journal, July 10.

Public Health, Effect on It of Proximity of Animals to Human Habitation. By J. J. Kelly. 5 pp. Journal of Royal Institute of Public Health, June.

Bureau of Hygiene of Orleans, France. Method and work described. 2 pp. Technique Sanitaire, July 1.

Preventive Sanitation. General thesis. By Surgeon-General Walter Wyman. 3 1-2 pp. American Federationist, July.

School Hygiene, The Approaching Congress on. Editorial. 1 1-4 pp. Charities and the Commons, July 20.

Pure Milk Problem. Review of article in the Craftsman. By John Spargo. 1-2 p. Municipal Journal and Engineer, July 3.

Rochester's Milk Work. Described by Health Officer G. W. Goler. 1-2 p. Municipal Journal and Engineer, July 31.

Rochester's Milk Experiment. Review of description in McClure's. 1-2 p. Municipal Journal and Engineer, July 3.

Milk, Safeguarding the City's Supply. "Life, Health and Our Milk Supply." By Carrington A. Phelps. 13 pp. Illustrated. The Metropolitan Magazine, July.

"A Big City's Milk Problem." By Day Allen Willey. 13 pp. Illustrated. Van Norden's Magazine, July.

Ice, Impure Manufactured. Synopsis of report concerning Washington, D. C. 1-3 p. Municipal Journal and Engineer, July 24.

Typhoid Fever in Washington, D. C. Abstract of official report of Investigating Board. 2 pp. Engineering News, July 11.

Enteric Fever, "Carrier Cases" of. From annual report of India Sanitary Commission. 5 pp. Public Health, July.

WATER SUPPLY

Description of Scunthorpe Water Works. Paper before Association of Water Engineers. By Alexander M. Cobban. 2 pp. The Surveyor, July 5.

Paignton Water Works. Description of reservoir and dam on Dartmoor. Illustrated. 1 1-2 pp. Municipal Journal, July 5.

Staine's Reservoirs for London's Water Supply. Paper before Association of Water Engineers (England). By R. E. Middleton. Illustrated. 3 1-2 pp. Water, July 15. 1 1-2 pp., Contract Journal, June 19. 2 pp., Municipal Journal and Engineer, July 17.

Catskill Water Supply for New York. Inauguration of work. 1 p., Water and Gas Review, July. 1 p., Engineering News, June 27.

Liverpool Water Works. Extracts from the engineer's annual report. Illustrated. 3 1-2 pp. Water, July 15.

Gravity Water Supply at Montrose, Colo. Brief description. 1-2 p. Engineering Record, July 13.

Santa Clara's Water Works, Electric and Gas Lighting Plants, Cost, Etc. 1 1-2 pp. Pacific Municipalities, June.

Water Works of Northfield, Vt. Illustrated description, including covered reservoir. 2 pp. Fire and Water, July 10.

Metropolitan Water Works System, Massachusetts. Description of the Wachusett dam and aqueduct. Illustrated. 4 1-2 pp. Municipal Engineering, July.

Water Works of Gloversville, N. Y. Statement largely financial. 1-2 p. Municipal Journal and Engineer, July 10.

Covered Reservoirs, London's. Brief description of the largest in the world. 1-2 p. The Surveyor, June 21.

Hollow Masonry Dam. Brief description of Rochester's Cobb's Hill reservoir. Illustrated. 3-4 p. Municipal Journal and Engineer, July 10.

Conduit of Salt Lake City Water Supply. Brief description of this 7 1-4 mile conduit. 1-3 p. Engineering Record, July 13.

Catskill Aqueduct. Brief description of part of New York's new supply. Illustrated. 3 pp. Fire and Water, June 26.

Reinforced Concrete Mains. Report of City Engineer of Norwich, England, on French constructions. 3-4 p. Municipal Journal and Engineer, July 10.

Water Works Tunnel Construction. Description of Southwest Land and Lake tunnel. Illustrated. 2 pp. Municipal Journal and Engineer, July 24.

Water Pipe System at Chicago. Recent improvements. Illustrated. 1 p. Fire and Water, July 3.

Valves for Large Water Mains. Suggests use on large mains of smaller valves. 3-4 p. Municipal Journal and Engineer, July 24.

Standpipes of Reinforced Concrete. Description of those so far erected. By Chas. E. Burdick. 1 1-2 pp. Cement and Engineering News, June.

Pumping Water by Producer Gas at St. Stephen, N. B. Paper before convention of American Water Works Association. By F. A. Barbour. 1 1-2 pp. Engineering Record, July 20.

High Duty vs. Low Duty Pumping Engines. Paper before American Water Works Association. By Irving H. Reynolds. Discussed. 3 1-2 pp. Fire and Water, July 10.

Electric Pumping, Economy of. 1-2 p. Electrical Review, July 6.

Costs of Pumping. Comparison of cost by steam, internal combustion and electricity. Paper before Institution of Civil Engineers. By Charles Hawksley and Henry Davey. 1 1-4 pp. Water, July 15.

Tuberculation of Water Mains. Paper before American Water Works Association. Discussed by George F. Whitney. 1-2 p. Fire and Water, July 3.

Maintenance of Water Mains, Tuberculation, Deposits and Methods of Removing Them. Synopsis of papers before American Water Works Association. By Nicholas S. Hill, Park Woodward and others. Illustrated. 3 1-4 pp. Municipal Journal and Engineer, July 3.

Cleaning Water Mains. Paper before American Water Works Association. By Park Woodward. 1 p. Municipal Engineering, July.

Repairing Water Mains. Abstract of papers before American Water Works Association. By C. W. Wiles and Henry A. Lord. 1 p. Municipal Journal and Engineer, July 10.

Repairing a Broken Force Main. Paper before American Water Works Association. By C. W. Wiles. 1 p. Municipal Engineering, July.

Repairing Broken Submerged Pipe Line. Paper before American Water Works Association. By Harry A. Lord. 1 1-4 pp. Municipal Engineering, July.

Testing Water Mains for Obstructions. Abstract of paper before Municipal and County Engineers. By R. H. Forman. 3-4 p. Municipal Journal and Engineer, July 17.

Dredging a Storage Reservoir. Hydraulic pump dredge to be used in Washington. 1-3 p. Municipal Journal and Engineer, July 24.

Managing a Small Water Works; some experiences in. Paper before American Water Works Association. By Howard Williams. 1 3-4 pp. Municipal Engineering, July.

Water Works Experiences. Paper read before American Water Works Association. By L. N. Case. 1 p. Fire and Water, July 17.

State Control of Water Supplies. An English view. 1 p. Water, June 15.

Water Rates. Residential address before American Water Works Association. By Dabney H. Maury. 1 1-4 pp. Engineering Record, June 29. 1 1-4 pp. Water and Gas Review, July. Engineering News, June 27.

Meters and Meter Systems. By William Bolkhardt. 1 p. Fire and Water, July 10.

Consumption, Waste and Meter Rates. Paper before American Water Works Association. By James L. Tighe. 3 pp. Fire and Water, July 3.

Effect of Meters on Consumption of Water. Discussion including some new data. Paper before New England Water Works Association. By William S. Johnson. Illustrated. 30 pp. Followed by discussion of 42 pp. Journal New England Water Works Association, June.

Water Purification at St. Louis. Abstract of paper before American Water Works Association. By W. F. Monfort. 1 3-4 pp. Engineering Record, July 27.

Water Filtration. Modern Tendencies outlined. Abstract of an article by Mr. George Whipple. 1-2 p. Revista Municipal, July 15.

Water Filtration at Lancaster, Pa. Brief description of plant. Illustrated. 1 p. Fire and Water, July 24.

Mechanical Filter Plant, The Care of. Paper before American Water Works Association. By J. M. Diven. 2 pp. Fire and Water, July 10.

Settling Basins of St. Louis Water Works. Illustrated description in detail of the construction of these new basins. 5 pp. Engineering Record, July 6.

Removing Tastes and Odors at Ludlow Reservoir, Springfield, Mass. General statement. 2-3 p. Engineering Record, July 27.

Copper Sulphate Treatment. Paper (misnamed "Stripping Reservoir Land") before American Water Works Association. By T. W. Davey. 1 p. Municipal Engineering, July.

Water Softening. Semi-popular description of the ordinary method. Paper before Engineering Conference. By William Matthews. 1-3 p. Local Government Journal, July 20. 1 p. Water, June 15.

Water Hardening. Paper before Engineering Conference. By James Watson. 1 1-4 pp. Water, July 15.

Water Analyses Interpretation. Abstract from bulletin of Rhode Island Board of Health. 1 p. Municipal Journal and Engineer, July 17.

Pollution of Wells by gasoline. Abstract of paper before American Water Works Association. By W. P. Mason. 1-3 p. Municipal Journal and Engineer, July 17.

Pollution of Underground Waters. Detecting and tracing the source. Paper before Association of Water Engineers. By John C. Thresh. 4 pp., Water, June 15. 1 p. Municipal Journal and Engineer, July 24. 2 1-2 pp., Contract Journal, June 19.

Lead or Zinc Poisoning from Service Pipes. Synopsis of paper before American Water Works Association. By W. P. Mason. 3-4 p. Municipal Journal and Engineer, July 31.

American Water Works Association. Description of exhibits and view of delegates. 2 1-2 pp. Municipal Journal and Engineer, July 3.

STREET LIGHTING AND ELECTRIC POWER

Boston Gas Agreement. Editorial. 1 p. The Outlook, July 20.

Philadelphia Gas Situation. Editorial. 1 p. The Outlook, July 13.

Philadelphia Gas Contract. "The Quaker City Good to Investors." Part of article. By F. D. McLain. 1 p. Moody's Magazine, July.

Attitude of Gas Companies Toward the Public. Paper before Iowa District Gas Association. By Jansen Haines. 1 p. American Gas Light Journal, July 1. 2 1-2 pp., Progressive Age, July 15.

Attitude of Gas Companies Toward the Public. Discussion before Iowa District Gas Association. 1 3-4 pp. American Gas Light Journal, July 8.

British Gas Statistics. Brief review of some English statistics. 1-2 p. Progressive Age, July 15.

Gas Meters and House Fittings. Standard methods for. Paper before Iowa District Gas Association. Illustrated. By G. I. Vincent. 3 pp. American Gas Light Journal, July 1.

Gas Rates in New York, of plants selling less than 20,000,000 feet per year. By Alton D. Adams. 1 p. Municipal Journal and Engineer, July 24.

Gas Rates in Boston and New York Compared. "Gas in Two Cities." Editorial. 1-4 p. Collier's Weekly, July 13.

Gas Prices. Discussion of the present trend. 1 p. Progressive Age, July 1.

High Pressure Gas Distribution Development in the United States. Technical paper before British Institution of Gas Engineers. By R. M. Searle. Illustrated. 7 1-2 pp. Progressive Age, July 1.

Hygienic Standpoint of Use of Gas, Technical Consideration of the subject in lecture before British Institution of Gas Engineers. By Prof. Vivian B. Lewes. 3 1-4 pp. Progressive Age, July 1.

Testing Gas, Past, Present and Future. From the Journal of Gas Lighting. By H. Leicester Greville. 1 1-4 pp. American Gas Light Journal, July 1.

Specifications for Street Lighting. Report of committee of National Electric Light Association. 2 1-2 pp., Illuminating Engineer, June. 3-4 p., Municipal Journal and Engineer, July 10. 1 p., Engineering Record, July 20.

Street Lighting Standards. Editorial discussing the recent recommendations of National Electric Light Association. 2-3 p. Engineering Record, July 20.

Specifications for Street Lighting. Editorial comment on report of committee of National Electric Light Association. 2 1-2 pp. Illuminating Engineer, June.

Units for Street Lighting, Large vs. Small, discussed before Illuminating Engineering Society. 1 p. Municipal Journal and Engineer, July 17.

Photometric Instruments. Topical discussion by several members of the New England Section of the Illuminating Engineering Society. 8 pp. Illuminating Engineer, July.

Municipal Lighting Contracts, Indefinite Obligations in. Paper before National Electric Light Association. By Henry Floy. 1 3-4 pp. Illuminating Engineer, June.

Indefinite Candlepower in Municipal Contracts. Paper before National Electric Light Association. By E. L. Elliott. 3 pp. Illuminating Engineer, June.

Municipal Lighting Plant of Barrie, Ont. Brief illustrated description. 1 1-2 pp. The Canadian Municipal Journal, July.

Cleveland Municipal Lighting Plant. Description of the plant in detail. Illustrated. 4 pp. Engineers' Review, July.

Electric Street Lighting in Iowa Cities of less than 5,000 population. Number, power, cost, etc. 1-2 p. Municipal Journal and Engineer, July 17.

Life of an Electric Plant. An estimate presented to the Institution of Electrical Engineers. By Robert Hammond. 1-4 p. Municipal Journal and Engineer, July 3.

FIRE AND POLICE

Fire, The Annual Loss By, and Faulty Construction as a Cause. By E. W. Fitzpatrick, executive officer of International Society of Building Commissioners. 2 pp. Moody's Magazine, July.

Causes of Fire. Classification of Hazards. By Henry A. Fiske. 20 pp. Insurance Engineering, July.

Causes of Fires, Data Collected by the Continental Fire Insurance Company. 3-4 p. Municipal Journal and Engineer, July 10.

Fire Statistics of St. Paul for 1906. Causes and frequency of alarms. 1-4 p. Municipal Journal and Engineer, July 31.

High Pressure Fire Protection. Abstract of engineer's report on proposed auxiliary water supply system for Hartford, Conn. 2-3 p. Engineering News, July 18.

Police Administration. History of development of modern from ancient methods. By Leonhard Felix Field. 4 1-2 pp. Municipal Journal and Engineer, July 3.

"Dogs as Policemen." Their Use in Ghent. By Gustave Abel. 5 1-2 pp. The Independent, June 27.

GOVERNMENT AND FINANCE

Good Government, Popular Understanding of Facts a Recipe for. By Wm. H. Allen, secretary Bureau of Municipal Research, New York. 2 1-4 pp. Charities and the Commons, July 20.

City Government, Des Moines' Plan. The new charter, giving commission form of government. 8 1-4 pp. Bulletin, League American Municipalities, July.

Initiative and Referendum, News Notes on. By Ralph Albertson. 4 pp.

The Arena, June. "Some Facts About." Editorial. 3 pp. The Arena, June.

Direct Legislation, Fight for in Massachusetts. Editorial. 7 pp. The Arena, June.

By Commission, Government, in Texas. By W. B. Slosson. 6 pp. Illustrated. The Independent, July 25.

London Election, Meaning of. Review of editorial in the Arena. 1 1-4 pp. Municipal Journal and Engineer, July 3.

Municipal Ownership and the London Election, "The 'Defeat' of, in London." By Frank F. Stone. 3 pp. The Arena, June.

Municipal Ownership. Editorial on organized effort for combating this. 3-4 p. Municipal Journal and Engineer, July 17.

Municipal Ownership. Abstract of report of National Civic Federation Commission. 7 pp., Street Railway Journal, July 20. 1 p., Electric Railway Review, July 20. 1 p., American Gas Light Journal, July 22. 1 2-3 pp., Engineering Record, July 27. 1 p., Electric Railway Review, July 13. 1 p., The Outlook, July 27.

Municipal Ownership. Synopsis of work done by National Civic Federation Committee. ½ p. Electrical Review, July 27.

Municipal Ownership of Gas and Electric Lighting Properties. Abstract of report of the National Civic Federation's Committee. 1 3-4 pp. Street Railway Journal, July 27.

Municipal Ownership of Street Railway Properties. Abstract of report of National Civic Federation Committee. 8 pp. Street Railway Journal, July 27.

Record of Liverpool's Municipal Street Railways for 1906. Editorial. 1-2 p. The Arena, June.

Labor Under Municipal Ownership. Discussion of report of National Civic Federation Committee. 1 p. Street Railway Journal, July 27.

Municipal Ownership, a Bi-Partisan View of. Editorial on report on National Civic Federation Committee. 1 1-2 pp. The Illuminating Engineer, July.

Investigation and Conclusions of the London Daily Telegraph. Editorial. 1-2 p. The Arena, June.

Significance of the Chicago Election. Review of editorial by Louis F. Post in The Public. 2 pp. The Arena, June.

"Public Ownership News," Notes. By Ralph Albertson. 4 pp. The Arena, June.

Municipal Taxation, Methods in Northwest Canada. By J. Kelso Hunter. 1 p. Western Municipal News, July.

Equitable Basis for Taxation. A plea for this. Paper before Empire State Gas and Electric Association. By L. P. Palmer. 1-2 p. Progressive Age, July 15.

Taxes Becoming Confiscation. Plea for moderation in taxing rapid transit property. 1-2 p. Electrical Railway Review, July 27.

Bond Sales, Municipal. Statement of sales during May. 1 p. Municipal Journal and Engineer, July 3.

Municipal Accounts and Reports. Abstract of discussion by L. E. Gosselin, Auditor and Deputy Comptroller of Chicago. 1 1-2 pp. Municipal Engineering, July.

Uniform Accounting. Paper before Empire State Gas and Electric Association. By Charles H. Hart. With discussion. 3 1-2 pp. Progressive Age, July 15.

Uniform System of Municipal Accounting, Description of Iowa's. 1 p. Pacific Municipalities, June.

Depreciation of Electrical Plants. Necessity of providing for. By Robert Hammond. 2 3-4 pp. Engineering Magazine, July.

Water Works Accounts and Management, Experiences in Examining. Paper before American Water Works Association. By John F. J. Mulhall. 1 1-2 pp. Municipal Engineering, July.

Soldier Preference in Kansas. Discusses law compelling employment of soldiers of the Rebellion. By Sheffield Cowdrick. 1 1-4 pp. Municipal Journal and Engineer, July 10.

Instruction in Municipal Government. "The Intercollegiate Civic League." Editorial. 1 p. The Outlook, June 29.

"San Francisco's Struggle with Graft." By W. H. Thomson. 6 pp. Illustrated. The World To-day, July.

"The Case of San Francisco," an optimistic presentation of conditions. By ex-Mayor James D. Phelan. 3 pp. Portrait. Review of Reviews, July.

The San Francisco Situation. Editorial. 1 p. The Outlook, July 20. The New Mayor of. Editorial. 1 p. The Outlook, July 27.

Brand Whitlock, Mayor of Toledo, and His Ideals. Editorial. 5 pp. The Arena, June.

REFUSE COLLECTION AND DISPOSAL

Clean Streets, Responsibility of Building Contractors. Editorial. 1-3 p. The American Architect, June 22.

Street Cleaning Conditions on East Side, New York, and Their Remedy. By Charles S. Bernheimer. 2 pp. Charities and the Commons, July 27.

Street Cleaning Accounts. Detailed description of methods employed in the Borough of Richmond, New York. Illustrated. By J. F. Fetherston. 8 pp. Municipal Journal and Engineer, July 3.

Removal of Ashes and Garbage. Data from fifty cities collected by committee of Albany Medical Society. 1-2 p. Municipal Journal and Engineer, July 31.

Disposal of Municipal Waste. Illustrated description of several furnaces. By W. F. Morse. 4 1-4 pp. Municipal Journal and Engineer, July 3.

PARKS AND CITY BEAUTY

Park Developments. News notes and comments. 4 1-2 pp. Illustrated. Park and Cemetery, July.

New York's Seaside Reservation. "The New Park at Rockaway." By Herman A. Metz, Comptroller of New York City. 1 p. The Independent, June 27.

Popular Use and Abuse of City Parks. "Parks, People, Picnics and Police." Editorial. 1 1-2 pp. Charities and the Commons, July 6.

Jackson Park, Chicago, a Description. By "R." 1-2 p. Gardening, July 1.

Playgrounds, New Era for. The Significance of the National Convention in Chicago. Editorial. 1 p. Charities and the Commons, June 29.

In Chicago's South Park System, The Year's Record. 1 1-2 pp. Diagram. Park and Cemetery, July.

The Chicago Convention. 1 p. Illustrated. Park and Cemetery, July.

Riverside Drive, New York—"Feats in Building." 3-4 p. Illustrated. Park and Cemetery, July.

Sculpture. Descriptions of McClellan Memorial, Washington; Sullivan Fountain, New York; and Wheelock Memorial, St. Paul. 1 1-2 pp. Illustrated. Park and Cemetery, July.

Trees, the Best for Village Planting. By Roger DeLand French. 2 pp. The Village, July.

"Street Shade Trees and Their Troubles." An address before Worcester County, Massachusetts, Horticultural Society. By Prof. G. L. Stone. 2 pp. Park and Cemetery, July.

Shade Tree Legislation. Synopsis of the recently passed Pennsylvania law. 1-2 p. Municipal Journal and Engineer, July 3.

Civic Improvements. Comments upon report of New York City Improvement Commission. By Charles Mulford Robinson. 4 pp. Architectural Record, August.

Civic Center, Plan of Charles Mulford Robinson for Oakland. 1 p. Diagram. Park and Cemetery, July.

Chicago's Plans for Improvement. Editorial. 1 p. The Outlook, July 13.

Denver's Transformation. 1-2 p. Charities and the Commons, July 13.

Rio de Janeiro Made Beautiful—"A Dream City Realized." By Rev. Bennett. 12 pp. Illustrated. Van Norden's Magazine, July.

Topographical Transformation of Paris. History and description of work done by Baron Haussmann. Illustrated. By Edward R. Smith. 13 pp. The Architectural Record, August.

Architectural Developments on Fifth Avenue, New York—"The New Fifth Avenue." By A. C. David. 14 pp. Illustrated. The Architectural Record, July.

Billboard Legislation. Bill in English Parliament and court decision in Buffalo, N. Y. Editorial. 1 1-2 pp. The Outlook, July 6.

Advertisement Control in France—"Street Disfigurement." Editorial. 1-2 p. Collier's Weekly, July 6.

Same. 1-2 p. Harper's Weekly, July 13.

Why Newspapers Should Oppose—"Down with the Billboard." Editorial. 1-6 p. Leslie's Weekly, July 4.

Proposal to Tax in Ohio. Editorial. 1-6 p. Leslie's Weekly, July 4.

Cincinnati War on. 1 1-3 pp. Illustrated. Park and Cemetery, July.

Current News of Billboard Restriction Efforts. 2 1-2 pp. Park and Cemetery, July.

Garden Cities Association of America, Its Organization and Plans. By W. D. P. Bliss, secretary. 3 pp. The Village, July.

TRAFFIC AND TRANSPORTATION

Tunneling in St. Paul. Description of double track street railway tunnel now under construction. Illustrated. 4 1-2 pp. Concrete, July 15.

Detroit River Tunnel. Brief description. 1-2 p. The Engineer, July 1.

Battery Tunnel, New York. Abstract of report of Nelson P. Lewis as to alleged effects in this tunnel. 1 p. Engineering Record, July 13.

Tunneling Operations of New York. Paper before American Institute of Mining Engineers. Illustrated. By H. T. Ildage. 3 3-4 pp. Engineering-Contracting, July 3-10.

East River Tunnel of New York Subway. Description of grade correction and pile foundation. Illustrated. 1 1-2 pp. Engineering News, July 27.

New York's New Terminals and Tunnels—"Manhattan, an Island Outgrown." By Walter Pritchard Eaton. 12 pp. Illustrated. American Magazine, July.

Interurban Trolleys in Indiana—"Emancipation by Trolley." By Merrill A. Teague. 11 pp. Illustrated. Appleton's, July.

Possibilities of—"The Future of Transportation." The trolley as a long-distance line. By Alexander Hume Ford. 12 pp. Illustrated. Metropolitan Magazine, July.

Philadelphia's Rapid Transit Lease—"The Quaker City Good to Investors." Part of article. By F. D. McLain. 1 1-2 pp. Moody's Magazine, July.

Operating Statistics for Street Railways. Method of filing, keeping books, etc., recommended. By Albert F. Allen. 5 pp. Journal of Accountancy, July.

Urban Railways, Operating Cost and Revenue. Analysis of New York Interborough system. By Girard B. Werner. 8 pp. Engineering Magazine, August.

Municipal Tramway Operation. Review of report on British tramways by National Civic Federation Committee. 2 pp. Electric Railway Review, July 27.

Fare Collection and Registration. The Rooke system in Providence. 1-2 p. Street Railway Journal, July 13.

Track Elevation in Indianapolis. Abstract of papers before Indiana Engineering Society. 3 pp. Municipal Engineering, July.

Brennen-Mono Railway. Principle of the gyroscope equilibrium explained. 1 3-4 pp. Engineering Magazine, July.

MISCELLANEOUS

Descriptions of Cities and Towns—"Outdoor Boston," Impressions of. By Samuel M. Crothers. 9 pp. The Century, July.

Herculaneum, as revealed by excavations. By T. Ashby, Litt. D. 5 pp. The Independent, July 4.

Barton, Vt.—"Barton and Its Development Association." By Colby Stoddard. 5 pp. The Village, July.

Hatfield, Mass., Historic. By Reuben F. Wells. 4 pp. Illustrated. The Village, July.

"Camaguey, Cuba's Most Primitive City." By Mrs. C. R. Miller. 1 p. Illustrated. Leslie's Weekly, July 11.

"Mount Vernon, N. Y.—A Suburban City." By H. W. Mathews. 3 pp. Illustrated. Suburban Life, July.

San Antonio, Texas—Impressions and Contrast with Other Texan Cities. By Frank Putnam. 12 pp. Illustrated. New England Magazine, July.

Los Angeles, History and Growth—"The Making of." By Bertha H. Smith. 18 pp. Illustrated. Sunset Magazine, July.

Mound Bayou, Miss.—"A Town Owned by Negroes," exemplifying thrift and self-government. By Booker T. Washington. 9 1-2 pp. Illustrated. World's Work, July.

Siena, History and Art of. By Honoré Mereu. 1 1-2 pp. The American Architect, July 20.

Municipal Works of St. Andrews. Lighting, paving, cleaning, etc., in this Scotch city. By William Watson. 3 1-2 pp. The Surveyor, June 21. Contract Journal, June 19.

Municipal Works of Gary, Ind. Paving, water works, sewerage, gas and electric light systems, constructed complete de novo for this industrial city. Illustrated description. 4 pp. Engineering Record, July 20.

Kyoto, Japan, Municipal Engineering Works of. Brief description. Illustrated. By S Tanabe. 1 p. Engineering News, July 4.

Municipal Progress in Paducah, Ky. Present extent of public improvements. 1 p. Municipal Engineering, July.

British and American Municipalities. Discussion of part of the report of the National Civic Federation's Committee. By Lewis E. Palmer. 2 1-2 pp. Charities, July 27.

Report on Municipal Utilities. Treats of European and American cities. By F. W. Caldes, City Surveyor of Prahran, Australia. 1 1-2 pp. Municipal Journal and Engineer, July 17.

Civic Improvement, Various Notes on. 3 1-2 pp. Notes and Comments department, The Architectural Record, July.

Notes on. 2 1-2 pp. Charities and the Commons, July 13.

In Appleton, Wis.—"What the Women Have Accomplished." By Albert P. Schimberg. 1 1-2 pp. Suburban Life, July.

North Dakota Convention on. 1 p. Park and Cemetery, July.

News Notes of Village Improvement Societies. Edited by Edward T. Hartman. 2 pp. The Village, July.

Co-Operation as Keynote of Village and Town Improvement. 1 p. The Village, July.

Rhode Island League of Improvement Societies, Work of. By Edwin A. Noyes, president. 3 pp. Illustrated. The Village, July.

Obliterating Slums a Duty. From address of Surgeon-General Wyman. 1-3 p. Municipal Journal and Engineer, July 27.

Congestion, Relief of—The Salvation Army Plan for "Transplanting a City's Poor." By Elizabeth A. Hunter. 2 1-2 pp. World's Work, July.

Housing Conditions in Chicago. Editorial. 1 p. Charities and the Commons, July 13.

Manufacturing Suburb for San Francisco. A predicted result of the Southern Pacific's Bay Shore Cut-off. By Rufus Steele. 10 pp. Illustrated. Sunset Magazine, July.

Baths and Wash Houses at Plumstead, England. Description, with plans. 4 pp. The Surveyor, June 28.

Town Planning. Paper before Municipal and County Engineers. Describes a Liverpool suburb. By C. F. Wike. 1 1-2 pp. The Surveyor, July 5. 3-4 p. Contract Journal, July 3.

Bascule Bridges. Illustrated descriptions of the Rall, Page & Scherzer types of bascule bridges. 1 2-3 pp. Engineering News, July 18.

Galveston Sea Wall. Description of a wall requiring 13,305 carloads of material. By H. H. Haines. Illustrated. 5 1-2 pp. Cement World, July.

Conduit System of Nashville, Tenn. Paper before Engineering Association of the South, giving details of construction. By W. F. Roberts. 8 pp. Proceedings, Engineering Association of the South, Second Quarter.

Central Station Heating. Comparison of steam and water. Paper before Iowa Electrical Association. By W. H. Schott. 1 1-2 pp. The Engineer, July 1.

Reinforced Concrete. Report of Committee of Royal Institute of British Architects. 11 pp. Concrete, July.

Reinforced Concrete Wharves and Quays. Description of Harwick quays. By W. Noble Twelvetrees. Illustrated. 9 pp. Concrete, July.

Reinforced Concrete Pipes in France. Report of City Engineer of Norwich, England. Illustrated. 2 1-2 pp. Concrete, July.

Testing Portland Cement. Description of simple tests. Abstracted from Municipal Journal and Engineer. 1 p. Water, July 15.

Sub-Pavement Space, Another demand on, for wires of Telharmonic Company. 1-4 p. Municipal Journal and Engineer, July 3.

Cost Keeping as an Aid in Managing Men. Paper before Pacific Northwest Society of Engineers. By Halbert P. Gillette. 3 pp. Engineering-Contracting, July 17.

Reports of Municipal Work. Extracts from paper before League of American Municipalities. By Hugh Grosser. 1 1-2 p. Pacific Municipalities, June.

Municipal Horses, Working and Care of. Paper before Association of Cleansing Superintendents. By Eaton Jones. 1-4 p. Local Government Journal, July 20.

Patented Articles, Municipal Use of. Reply to article on same subject in May 29 number. By Edgar H. Boles. 2 1-2 pp. Municipal Journal and Engineer, July 31.

Enforcement of Specifications. Presidential address before American Society of Testing Materials. By Charles B. Dudley. 4 pp. Engineering Record, June 29. Engineering News, July 4.

Building Stones, The Characteristics of Good. By R. D. George. 11 pp. Chemical Engineer, June.

Permeability of Soils, Experiments on the. Illustrated description of experiments made by G. Thein. 2 pp. Technique Sanitaire, July 1.

Protecting Iron and Steel from Pollution. Paper before American Foundrymen's Association. By Alfred Sang. 6 1-2 pp. Chemical Engineer, June.

Railroads and Town Improvement. By Mary R. Cranston. 4 pp. Illustrated. The Village, July.

Vagrancy, Formation of National Committee on. Action taken at National Conference of Charities and Correction. By O. F. Lewis. 3 pp. Portrait. Charities and the Commons, June 29.

BOOK REVIEWS

A Year of Civic Effort, Consisting of Addresses and Reports of the Annual Meeting of the Civic League of St. Louis, Mo., 1907. In issuing this pamphlet, the Executive Board states that in addition to placing before the members and citizens in general the results of the labors of the several committees, it is also desired to impress on them the importance of an independent, non-partisan association whose sole purpose is municipal improvement. The address of President Henry T. Kent outlines the general policy of the League, reviews the work of the committees, and goes at considerable length into the work of the City Plan Committee. Secretary Milo Fisher, in an address, discusses civic philistinism. He advocates the opening of a hall where meetings of civic organizations can be held, as a remedy for this evil. Civic improvements too, he says, dispel low civic ideals. The report of Treasurer N. A. McMillan shows the receipts of the League were $9,854, as compared with $4,487 in the previous year. Reports of committees deal with: Membership; press, publication and public meetings; municipal and State legislation; charter revision; smoke abatement; public sanitation; tree planting; eleemosynary institutions; housing; signs and billboards; tuberculosis prevention; historic sites; city lighting. The constitution of the League closes the pamphlet.

NEWS OF THE SOCIETIES

Union of Canadian Municipalities.—The seventh annual convention will be held at Fort William and Port Arthur, Ont., August 12-16. The objects of the Union are declared to be the general improvement and facilitation of every branch of municipal administration by the following means: First, the perpetuation of the organization as an agency for the co-operation of Canadian municipalities in all questions pertaining to municipal administration; second, in particular the guidance and improvement of legislation, both of the Dominion and the Provinces, upon municipal questions, and the betterment of municipal government and the promotion of municipal interests generally; third, the holding of annual conventions for discussion, information and resolutions on the above subjects; fourth, the securing of united action for the protection of individual municipalities and municipal interests, as a whole, against legislation or other encroachments of corporations. The programme follows:

Tuesday, August 13.—At the City Hall, Fort William. 11 a.m., Meeting of the Executive to arrange procedure. 2 p.m., Convention opens. Addresses of welcome, their Worships Mayor Murphy, Fort William and Mayor Clavet, Port Arthur. Reply on behalf of the visiting delegates. Presidential Address, President Coatsworth, Mayor of Toronto. Report of Hon. Sec.-Treas. W. D. Lighthall, Esq., K.C., Ex-Mayor of Westmount. Financial Report, G. S. Wilson, Ass't Secretary. Report of Official Organ, H. Bragg, Editor, Canadian Municipal Journal. Discussion and Resolutions. City Hall, Fort William. 7.30 p.m., Meeting of Executive. 8 p.m., Report of Committee on Resolutions. Report of Ontario Municipal Association, President Ellis, Ex-Mayor of Ottawa, Ont. Report of Quebec Municipalities, Vice-president U. C. M., L. A. Lapointe, Esq., Alderman of Montreal, Que. Report of Manitoba Union of Municipalities, President Cochran, Reeve of Blanshard, Man. Report of British Columbia Union of Municipalities, President Keary, Mayor of New Westminster, B. C. Report of Alberta Union of Municipalities, President Michener, Ex-Mayor of Red Deer, Alta. Report of Saskatchewan Union of Municipalities, President McAra, Ex-Mayor of Regina, Sask. Report of Nova Scotia Union of Municipalities, President MacIlreith, Mayor of Halifax, N. S. Report of New Brunswick Union of Municipalities, President Sears, Mayor of St. John, N. B. Report of Executive U. C. M. on Federation of Municipal Unions, Hon. Sec.-Treas. W. D. Lighthall, Esq., Ex-Mayor of Westmount, Que.

Wednesday, August 14.—At the City Hall, Port Arthur. 10 a.m., Meeting of Executive. 10.30 a.m., Report of Committee on Resolutions. Unfinished Business of last Convention. New Business. Address, G. W. Stephens, Esq., M.L.A., President of Board of Harbor Commissioners, Montreal, "Montreal Harbor, Present and Future." Address, S. Morley Wickett, Esq., Ph.D., Toronto, "Some Present Municipal Problems." Address, Joshua Dyke, Esq., Ex-Mayor of Fort William, Ont., "Municipal Ownership, Its Difficulties and Advantages, as Illustrated in the Cities of Fort William and Port Arthur." Discussion and Resolutions. 1.30 p.m., Assemble for group photo of Convention. By invitation of the Reception Committee, the Inspection of Work and Improvements on the Harbors of Port Arthur and Fort William, and the Kaministiquia River, returning by Municipal Street Cars from West Fort William to Power Plant at Current River. 7.30 p.m., Meeting of Executive. 8 p.m., Report of Committee on Resolutions. Address, D'Arcy Scott, Esq., Mayor of Ottawa, Ont., "Municipal Electric Supply." Address, J. W. Bowlby, Esq., Mayor of Brantford, Ont., "The Municipal Development of a Manufacturing City." Address, W. A. Greisbach, Esq., Mayor of Edmonton, Alta., "City Government by Commission." Address, J. A. Robb, Esq., Mayor of Valleyfield, Que., "Electric Light for Streets and Municipal Buildings." Address, P. J. Finlan, Esq., Mayor of Cobalt, Ont., "Some Difficulties of a Mining Town." Discussion and Resolutions.

Thursday, August 15.—At the City Hall, Fort William. 10.30 a.m., Report of Committee on Resolutions. Address, Hon. J. H. Howden, Minister of Telephones, Manitoba, "The Telephone Question in Manitoba." Address, J. G. Kinnaird, Esq., Commissioner of Edmonton, Alta. "Problems of Municipal Financing." Address, H. A. Ekers, Esq., Mayor of Montreal, Que., "Problems of a Cosmopolitan City." Address, W. Cousins, Esq., Mayor of Medicine Hat, Alta., "The Advantages of Natural Gas.' 'Discussion and Resolutions. By invitation of the Reception Committee, a visit to the Power Plant at Kakebeka Falls, and Inspection of Municipal Undertakings. 1.30 p.m., Report of Committee on Resolutions. Address, J. H. Ashdown, Esq., Mayor of Winnipeg, Man. 8 p.m., Address, A. Bethune, Esq., Mayor of Vancouver, B. C. Address, S. E. Clement, Esq., Mayor of Brandon, Man., "A Belt Line Railway." Address, A. J. Morley, Esq., Mayor of Victoria, B. C. Address, S. J. Craig, Esq., Mayor of Olds, Alta., "Mounted Police vs. Town Police."

Friday, August 16.—At the City Hall, Fort William. 10 a.m., Addresses are expected from Mayor Belyea, of Kenora, Ont.; Mayor Bunnell, of Moose Jaw, Sask.; Mayor Cameron, of Calgary, Alta.; Mayor Grimsby, of Sault Ste. Marie, Ont.; Mayor Judd, of London, Ont.; Controller Ward, of Toronto, Ont.; Alderman Andrews, of Brantford, Ont.; Alderman Johnson, of Halifax, N. S.; Alderman Lavallee, of Montreal, Que.; Alderman McGhie, of Toronto, Ont. 11 a.m., Meeting of Executive. 2 p.m., Report of Committee on Resolutions. Election of Officers. Next Place of Meeting. Closing.

Illuminating Engineering Society.—The first convention of the Society opened in the Assembly Hall of the new Edison Company building, Boston, Mass., July 30. John Campbell, chairman of the committee of arrangements, called the meeting to order. Immediately the business of the session was taken up, with Dr. Clayton H. Sharp, the President of the Society, in the chair. The Secretary, V. R. Lansingh, reported that the Society was but eighteen months old and its present membership was 1,047. The five original departments—New York, Chicago, Philadelphia, Pittsburg and Boston — are still in the organization, and by autumn he believed there would be four more sections—San Francisco, Los Angeles, Cleveland and St. Louis. The membership in the individual sections now is: New York, 347; Philadelphia, 181; Chicago, 66; Pittsburg, 94; Boston, 97; miscellaneous, 262, of which 32 are foreign members. As the Secretary was making certain announcements, Governor Guild and Mayor Fitzgerald entered and addressed the convention.

The convention then listened to the President's annual address, which was entitled "The Concepts and Terminology of Illuminating Engineering." Dr. Sharp's paper was a highly technical one, and as the speaker said in conclusion, its purpose was to point out the utility of certain ideas and names which should prove useful in the pursuit of the theory and practice of illuminating engineering. The paper was followed by a discussion. Other papers on the programme were "Primary, Secondary and Working Standards of Light," by Dr. Edward P. Hyde, of Washington; "The Present Status of Candle-Power Standards for Gas," by C. H. Stone, of Albany, and others. At noon a recess was taken for luncheon, and at 1:45 the convention was again called to order to listen to other papers, the speakers named on the programme being: T. J. Little, of Gloucester, N. J.; Nelson Goodyear, of New York; Dr. Charles H. Williams and R. S. Hale, of this city; Preston S. Miller and others. In the evening there was a special social session for members, ladies and guests in the Assembly Hall of the Edison building. During the days there were about 150 delegates and guests present at the sessions.

Texas Mayors' Association.—At the Amarillo meeting, held July 5 and 6, Mineral Wells, Tex., was chosen as the next meeting place. John H. Bonner, Mayor of Tyler, Tex., was elected President by acclamation.

Calendar of Meetings

August 5-8.
International Housing Congress.—London, England.

August 6-9.
North Carolina State Firemen's Association.—Convention and tournament, Wilmington, N. C.—W. C. Van Glahn, Secretary.

August 7-8.
Connecticut State Firemen's Association.—Convention, New Haven, Conn.—R. V. Mayers, Secretary, Watertown.

August 7-9.
The International Association of Municipal Electricians.—Annual convention, Jamestown Exposition, Norfolk, Va.—F. P. Foster, Secretary, Corning, N. Y.

August 12-17.
The Union of Canadian Municipalities.—Seventh Annual annual convention, Fort William and Port Arthur.—G. S. Wilson, Asst. Secretary, 107 St. James street, Montreal, P. Q.

August 15-16.
Louisiana State Firemen's Association.—Convention and tournament, Thibodeaux, La.—William Kleinpeter, Secretary, Gretna, La.

August 15-17.
American Association of Park Superintendents. — Annual convention, Toronto, Ont.—F. L. Mulford, Secretary, Harrisburg, Pa.

August 20-22.
Wisconsin Paid Firemen's Association.—Convention, Oshkosh.—F. L. Colton, Secretary, La Crosse.

August 20-23.
New York State Firemen's Association.—Convention, Elmira, N. Y.

August 25-30.
Virginia State Firemen's Association.—Convention and tournament, Newport News.—G. C. Cummings, Portsmouth, Secretary.

August 27-30.
Traveling Engineers' Association.—Annual convention, Chicago, Ill.—W. O. Thompson, Secretary, Oswego, N. Y.

September 2.
Rhode Island State Firemen's League.—Tournament, Warren, R. I.—Fred. W. Cady, Secretary, East Providence.

September 3-5.
National Firemen's Association.—Convention, Oklahoma, Okla.—Peter J. McCarthy, Secretary, Box 600, St. Louis, Mo.

September 11-13.
New England Water Works Association.—Annual convention, Springfield, Mass.—William Kent, Secretary, Narragansett Pier, R. I.—Office, Tremont Temple, Boston, Mass.

September 17-19.
National Association of Controllers and Accounting Officers.—Second annual convention, Hotel Jefferson, Richmond, Va.—Howard C. Beck, Secretary, Detroit, Mich.

September 17-19.
American Society of Municipal Improvements.—Annual convention, Detroit, Mich.—George W. Tillson, Secretary, 831 Ocean Avenue, Brooklyn.

September 17-19.
League of Iowa Municipalities.—Tenth annual convention, Council Bluffs, Iowa.—T. G. Pierce, Secretary, Marshalltown, Ia.

September 19-21.
League of American Municipalities.—Annual convention, Jamestown Exposition.—John MacVicar, Secretary, Des Moines, Ia.

October 8-11.
International Association of Fire Engineers.—Thirty-fifth Annual Convention, Washington, D. C.—James McFall, Secretary, Roanoke, Va.

October 14-18.
American Street and Interurban Railway Association.—Annual convention, Atlantic City, N. J.—B. V. Swenson, Secretary, Engineering Societies Building, 33 West Thirty-ninth street, New York.

November 19.
National Municipal League. — Annual convention, Providence, R. I. (in conjunction with the American Civic Association).—Clinton Rogers Woodruff, Secretary, North American Building, Philadelphia, Pa.

December 26.
International Sanitary Convention of American Republics.—Third international meeting, Mexico City.—Surgeon General Walter Wyman, Chairman, International Sanitary Bureau, Public Health and Marine Hospital Service, Washington, D. C.

LEGAL NEWS

Summary and Notes of Recent Decisions—Rulings of Municipal Interest

AUTOMOBILE SPEED ORDINANCE

Lambe vs. **Jacobsen.**—The plaintiff was run over in a city street by an automobile under circumstances in regard to which the evidence as to speed and other matters in the trial court was somewhat conflicting. Jacobsen, the appellant, from a judgment of $1,000, contending that there was not sufficient evidence to go to the jury upon the question of defendant's negligence, and that the evidence showed contributory negligence on the part of the plaintiff. The court said that the operation of an automobile in crowded streets necessitated great care, and that skill and care in its management should be exercised so as to anticipate collisions. The pedestrian should also exercise such care as an ordinarily prudent man would use. There was ample testimony to go to the jury upon the question of negligence, and the record was such that the jury's conclusions would not be disturbed. At the trial the allegation that the automobile was driven by the defendant was changed to one that it was driven by his servant in the line of his duty, and it was held not to bear alone of discretion. Judgment was affirmed.—Supreme Court of Washington.

AUTHORITY OF TOWN OVER EXPENDITURES

McConnell vs. **Allen et al., Town Board of Cortlandt.**—The laws of 1905 authorize the Supervisors of towns to invest certain moneys received from the city of New York for damages for relocating a road overflowed by a dam, and directs that the income shall be expended in such manner as the Town Board and Highway Commission may direct. Under laws of 1891 the Supervisor, etc., may expend any surplus moneys for which no provision for expenditure is made to redeem outstanding bonds or for improvements. Held, that the 1905 act governs the expenditure of such moneys received from the city, and not the 1891 act, and that the courts cannot direct upon what highways the income shall be expended, since the statute provides for the determination of that question by the Town Board and Highway Commissioner, but that the Board may be enjoined from expending the principal to improve a highway. Where a statute authorizes a public body or officer to do an act concerning the public interest, the execution of the power may be insisted upon as a duty, though the statute be only permissive in its terms.—Appellate Division, Supreme Court of New York.

MEASURE OF DAMAGES FOR ENCROACHMENT

Ackerman vs. **True.**—In an action against an adjoining landowner for an encroachment on the highway, the measure of damages was the difference in value between the plaintiff's premises with the encroachment and without it; and hence the court properly found that plaintiff suffered substantiated special damages where her property was worth less with the encroachment than without it; though it was worth more than it was before the encroachment.—Appellate Division, Supreme Court of New York.

AUTHORITY OF CITY COURT

Wright vs. **City of Anniston.**—The charter of Anniston confers on the City Recorder the right to hear and determine all cases of violations of ordinances, and to impose the fines and penalties prescribed by law or ordinance therefor, and confers on him the additional jurisdiction of a justice of the peace in criminal matters. An ordinance of the city prohibits assaults, and prescribes a penalty therefor. It was held that the Recorder has jurisdiction to try a defendant on charge of assault with a shotgun in violation of the city ordinance, notwithstanding, under the Criminal Code, a justice has no jurisdiction to try a case of assault with a weapon, since the ordinance covers all assaults, and the case was for determination thereunder.—Supreme Court of Alabama.

INTEREST ON DELINQUENT ASSESSMENT

English et ux. vs. **Territory.**—In a suit to collect a delinquent special assessment for a municipal improvement, the statutory 4 per cent. penalty should be computed only on the amount of the recovery, exclusive of the attorney fee of 25 per cent. of the judgment.—Supreme Court of Arizona.

PURCHASE OF WATER WORKS

Eau Claire Water Company vs. **City of Eau Claire.**—This was an action to restrain the city from enforcing an alleged right to purchase the plaintiff's water works. The water works were built under a grant of 1885 and have furnished water to the city ever since. In 1900, in accordance with the provisions of the ordinance, the city began proceedings for an appraisal of the property with a view to exercising its right to purchase. After the appraisal was made the city refused to exercise its right to purchase the property and the company continued its ownership and control until 1902, when differences arose between the city and the owners of the water works respecting the sufficiency of the plant and the service rendered. In the meantime the bondholders had had a receiver appointed. In view of these circumstances certain arguments regarding the improvement of the plant were decided upon and were carried out at an expense of $60,000. In 1905 the city notified the company that it desired an appraisal for the purpose of purchasing the works. Arbitrators were appointed—the company protesting—and the appraisal completed. In regard to the contention of the plaintiff that the city had no power to contract for the purchase of the water works and that, therefore, the parts of the ordinance respecting it were null and void, the court said that the power of a city to establish, maintain and operate a system of water works has been clearly recognized as within the exercise of powers granted to it to accomplish the usual functions pertaining to police regulations. This power was not exhausted, as alleged, by the proceedings of 1900. The claim that the agreement of 1902 either waived the right to purchase or postponed it for a period of five years from that date does not hold, because nothing appeared, either expressly or by implication, indicating that the agreement in the ordinance respecting the right to purchase was modified. The plaintiffs claimed that as steps were taken for the appointment of appraisers before the expiration of the five-year period, the proceedings were therefore void; but the court held that the city was not bound to decide whether it would purchase until the appraisal was made, so that a notice to the water company to appoint appraisers, served on August 4, 1905, was not premature when the five-year period was about to expire December 15. Regarding the company's claim that the city was financially unable to consummate the purchase, the court said that the question could not be determined at that time and that its merits could not arise under the facts.—Supreme Court of Wisconsin.

PERSONAL TAXES

Taylor vs. **Town of Caribou.**—In the assessment of personal property for taxation, under the Revised Statutes, the amount which the person to be taxed is owing is to be deducted from the money which he has at interest and the debts due him.—Supreme Judicial Court of Maine.

DEDICATION OF PLAT OF LAND

Edwards vs. **Buesha et al.**—A recorded plat of lands within a city, showing lots, blocks, streets and alleys, when filed by the owner of the land embraced in the plat, constitutes such dedication to public uses of the streets shown on such plat as will prevent the holder of the fee from maintaining an action for possession against an adverse claimant to a portion of the street. The city may protect its streets from encroachments by individuals for private uses.—Supreme Court of Oklahoma.

LAYING OUT IMPROVEMENT DISTRICT

Hallett vs. **United States Security & Bond Co. et al.**—In the absence of statutory regulations, the municipal authorities are vested with discretion in laying out a district within which local public improvements shall be made. A notice to "the property owners in sidewalk district No. 6," wherein the district was described with reference to streets, was a sufficient notice to the owners of abutting lots, under an ordinance providing for a notice to owners who had not paid for sidewalk construction. The provisions of a city charter, providing that owners of lots abutting on streets should receive notice to make complaints, against assessments for sidewalk construction, was not invalid because it did not specify the time or place for hearing objections. The charter and an ordinance pursuant thereto were not invalid because neither specified the character of objections which would be considered. The publication of an ordinance in relation to a street improvement was not invalid because published on Sunday; it not being a process. Where a portion of a street assessment was excessive, a property owner, before he could take advantage thereof, must tender the amount justly due.—Supreme Court of Colorado.

EMINENT DOMAIN— RIGHT OF WAY

State ex rel. Kent Lumber Co. vs. **Superior Court, Kings County et al.**—The fact that for a distance of ten or twelve miles a railroad agrees not to maintain stations or receive or discharge passengers or freight, in order that the water supply of a city may not be contaminated, does not take away the public character of the road, so as to prevent its exercise of the power of eminent domain as a common carrier. The statutes provide that a city shall have power to acquire lands necessary for any corporate use provided for in its charter, and to dispose of them as the interests of the city may require; held, that the city had power to grant permission to construct a railroad over land which the city had already appropriated for a pole line for the transmission of electricity.—Supreme Court of Washington.

STREET OBSTRUCTION—PERSONAL INJURIES

Grand Forks vs. Allman.—The Revised Code of North Dakota requires that before maintaining an action against a city for personal injuries a verified claim shall be presented to the Mayor and Common Council. Allman filed his claim with the Auditor and the court held that this was sufficient. The accident was caused by the plaintiff tripping over a plank that had been in the street from four to ten days, according to the evidence, for the purpose of protecting a water pipe. The court said that it is the duty of a city whenever a dangerous obstruction appears in its streets, even though it was unauthorized, to use reasonable dilligence to remove it, and what constitutes such diligence depends on the facts in each case, and especially upon the fact whether the existence and dangerous character of the obstruction was known, or in the exercise of reasonable supervision and diligence could have been known by the city in time to have caused its removal before it produced the injury complained of. Under the circumstances in this case when the plaintiff, walking at night on one of the most frequented streets of the city, met with the accident, the question of the city's negligence was properly submitted to the jury. The fact that the jury were not able to determine the exact number of days that the plank had been in the street was not inconsistent with the verdict for the plaintiff.—United States Circuit Court of Appeals.

SPECIAL TAXATION FOR SEWAGE PLANT

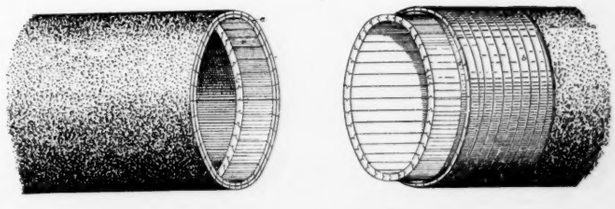
Glucose Sugar Refining Co. vs. **City of Marshalltown et al.**—Where a city, in order to construct a sewerage plant, borrowed $25,000 from complainant to construct the same, and agreed to repay the loan in installments in various ways, a provision of the contract that, in case after the year 1901 the total taxable value of all complainant's property should be fixed and kept at a sum not to exceed $5,000, then complainant for each year in addition to other credits would credit on the loan a sum equal to fourteen times the taxes on $5,000, or such proportionate amount in case the valuation exceeded $5,000, was separable from the remainder of the contract, and, if invalid, did not invalidate the balance.

A city having express statutory authority to construct sewers, as provided by the Iowa Code had power to borrow money for the purpose of constructing a plant for the disposition of the sewage. A contract by which complainant agreed to loan defendant city the sum of $25,000 for the construction of a sewerage plant to be repaid by a return of all water rents owing to the city from complainant, together with all taxes due the city on a specified valuation of the company's property, etc., was not objectionable as relieving complainant from the burden of taxation.—United States Circuit Court, Iowa.

Harrison vs. **Horton, City Auditor.**—The San Francisco charter authorizes the District Attorney to appoint seven assistants, to receive specified annual salaries. Plaintiff was appointed Assistant under an article empowering the Supervisors to authorize the appointment of additional deputies to any office. Another article prohibits, except as otherwise provided by the charter, the drawing of money from the Treasury unless on appropriations by the Supervisors, and provides that no warrant shall be drawn except upon an unexhausted specific appropriation. The Supervisors set apart a fixed sum for a fiscal year for the salaries of "the District Attorney, his assistants," etc. It was held that, after plaintiff's appointment, his demand for salary for his services passed beyond the Supervisors' control, that he was included in the appropriation, and that it cannot be said, because it was enough for the officers named, with the exception of one assistant, the intention was to exclude him, since he was as much an assistant as either of the seven appointed under the article.—Court of Appeals of California.

Machine Made Wood Pipe

THE development of machine made wood pipe has a history. Wood was the first material ever used for making pipe, but those pipes were simply logs bored out to the required diameter or as much as the log would permit. The next development took place on the Pacific Coast, where the price of cast iron pipe, on account of freights, was prohibitive There the problem was solved by cutting the logs into staves, planed on both sides to the arc of the circle desired, and beaded at the edges. These staves were built into a continuous pipe in the trench by banding them together with iron rods. Wood pipe as made in the shops of the Wyckoff Supply Company is quite a different product. There the pipes are assembled in lengths ready for shipment and laying, just as is done with iron pipe. Special features of the manufacture are interesting. The wood from which the staves are made is white pine, the best that can be procured. As the staves are run through the finishing machine, which cuts the double groove and tongue and planes the faces to circular and radial lines, a competent inspector of many years' experience handles every stave. He culls out about 15 per centum of the timber which comes to the factory. The winding machine used for banding the wood staves together is so arranged that the band can be wound at any desired tension, according to the set of the machine, which is regulated for each class of pipe, according to diameter and pressures specified. The tension can be made great enough to crush the wood in the large size pipe. During the manufacture of one standard a uniform tension and spacing is absolutely assured. The chambers and tenons are necessarily cut uniformly by a machine so that every joint between two pipes must fit, as the knives and heads are set alike for each size pipe. In order to avoid leaks at the joints there is supplied with each pipe a steel band of No. 18 gage, 1 1-2 inches wide, shaped to the proper diameter to fit into the saw kerf which is cut into the shoulder of the tenon and face of the chamber. This kerf is cut 1-2 inch deep, and the band being 1 1-2 inch wide, it is buried into 1-2 inch of the wood beyond the depth of the kerf, when the two pipes are being driven together, thus a water tight joint is secured for any pressure. The pipes are usually made in eight-foot lengths because they require a minimum expense in handling in shipment in box cars in which it is customary to ship them. Lengths of 16 feet are also made, but they are more difficult to join in the trench and do not give as good satisfaction on curves.



WYCKOFF WOODEN PIPE

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Buildings, Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we can not guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

State	City	Received Until	Nature of Work	Address Inquiries to
Street Improvements				
Indiana	Hartford City	August 8, 10 A.M.	Laying macadam Neal Road, Harrison Township	L. N. Dougherty, County Auditor.
Wisconsin	Milwaukee	August 8, 10:30 A.M.	Macadamizing Fourth and Cherry Sts.; brick and stone gutters, etc	Chas. J. Poetsch, City Engineer.
New York	Brooklyn	August 8, 3 P.M.	Constructing asphalt tile walks in three parks	Moses Herrman, Pres. Park Board.
New Hampshire	Hookset	August 8, 5 P.M.	Constructing gravel highway, to cost $8,100	A. W. Dean, Concord, State Eng'r.
New Hampshire	Concord	August 8, 5 P.M.	Constructing traprock highway, to cost $7,000	A. W. Dean, State Engineer.
New Jersey	Riverton	August 8, 8 P.M.	Laying 30,000 sq. ft. cement; grading, sodding, etc., 8,000 sq. yds. of walks	F. G. Brown, Mayor.
Alabama	Tuscaloosa	August 8	Constructing cement sidewalks and curbs	W. M. Faulk, Mayor.
Ohio	Cleveland	August 8	Curbing, paving, etc., 20 sts. with brick; 115th St. with asphalt, and number of other streets with Medina stone	A. R. Callow, Sec'y Bd. Pub. Service.
Ohio	Columbus	August 8	Paving 12 sts. with asphalt, brick or block	Edw. F. McGuire, Sec'y Bd. Pub. Serv.
Ohio	West Unity	August 8	Constructing nine miles of stone road in Brady Township	A. J. Hoover, Village Clerk.
Iowa	Des Moines	August 9, 11 A.M.	Paving 1,363 sq. yds. block on 6-in. concrete, grading 3,075 cu. yds., etc	W. W. Wise, Bd. Pub. Works.
Pennsylvania	Monessen	August 9, 6 P.M.	Grading, curbing and vit. block paving, 17,500 sq. yds	J. F. Irwin, Boro. Engineer.
Indiana	Valparaiso	August 9, 8 P.M.	Grading, draining and paving Erie St.; also sidewalk imp'm'ts.	Robert B. Ewing, City Clerk.
Ohio	Toledo	August 9	Paving Sherman St., any material, on concrete or broken stone.	Reynold Voigt, Sec'y Bd. Pub. Serv.
Ohio	Lakewood	August 9	Constructing delinquent sidewalks on number of streets	Evers Eng. Co., Cleveland.
Indiana	Indianapolis	August 9	Paving Meridian, St. Clair and 16th Sts. with creosoted blocks	Jos. T. Elliott, Pres. Bd. Pub. Wks.
Wisconsin	Two Rivers	August 9	Grading, graveling, macadamizing, curbing, Williams Street	John Gesell, Chm. Bd. Pub. Wks.
Ohio	Celina	August 10, 10 A.M.	Grading and macadamizing 4 miles, Romer and Jones Roads	H. Lutz, County Engineer.
Ohio	Findlay	August 10, noon	Constructing 2 miles stone pike, Portage, Van Buren township	J. W. Montgomery, Chm. Co. Comrs.
Ohio	Struthers	August 10, noon	Laying cement or stone crosswalks; grading Lowellville Ave	C. Creed, Village Clerk.
Indiana	Covington	August 10, 1:30 P.M.	Construction, etc., gravel road, 2¼ miles long, Mill Creek twp	Wm. B. Gray, County Auditor.
Illinois	Hardin	August 10, 7 P.M.	Building 12,000 sq. ft. or more granitoid sidewalks	A. B. Campbell, Village Clerk.
Michigan	Scottville	August 10, 8 P.M.	Excavating earth, 2,100 cu. yds.; cobblestone gutters, 1,775 sq. yds.; macadam paving, 4,428 sq. yds.; 6,000 ft. B. M. and imp. hemlock curb	W. C. Freedy, City Clerk.
Ohio	East Liverpool	August 10	Constructing brick road between E. Liverpool and Wellsville	J. C. Kelly, Engineer.
Ohio	Lisbon	August 10	Constructing brick highway under new Ohio law	Sam Huston, Columbus, Com'r.
Ohio	Bellevue	August 10	Paving 15,260 sq. yds., 2 sts., with vit. block on crushed stone base, with excavating, curbing, catch-basins, inlets, etc	J. C. Overmyer, Fremont, Engr.
Ohio	Lisbon	August 10	Grading and paving with brick E. Liverpool and Wellsville roads	R. G. Boyd, Chm. Co. Com'rs.
Ohio	Steubenville	August 12, noon	Improving Washington street	T. W. Vance, Clk. Bd. Pub. Service.
Ohio	Cincinnati	August 12, noon	Grading, paving with boulders, etc., North end Sixth St	M. J. Keefe, Clk. Bd. Pub. Serv.
Iowa	Cedar Rapids	August 12, 8 P.M.	Curbing, 1,000 lin. ft.; cement sidewalk, 2,500 sq. ft., 2 sts.	T. R. Warriner, City Clerk.
Michigan	Detroit	August 12	Resurfacing with creosoted block, bldg. brick roadway, etc	Philip Breitmeyer, Com'r Parks.
Michigan	Muskegon	August 12	Furn. and paving Western Ave. with brick, asphalt or other material	P. P. Misner, City Recorder.
Ohio	Youngstown	August 12	Paving Iona St.; grading Maple and Thurman Sts	W. H. McMillen, Clk. Bd. Pub. Serv.
Ohio	Euclid	August 12	Grading, draining and macadamizing Euclid Road	H. S. Dunlap, Village Clerk.
Wisconsin	Fond du Lac	August 12	Paving portion Fourth and Third Sts., with brick	J. F. Hohensee, City Clerk.
Ohio	Collinwood	August 12	Grading, draining and macadamizing Euclid road	H. S. Dunlop, Village Clerk.
Ohio	Struthers	August 12	Grading Lowellville avenue, according to plans, etc	C. Creed, City Clerk.
Indiana	Huntington	August 13, 7 P.M.	Vit. brick, stone curb S. Jeff. St.; cement walk Whitelock St.	J. B. Vernon, City Engineer.
Illinois	Chicago	August 13	Constructing cement sidewalks on a large number of streets	H. S. Dietrich, Pres. Bd. Local Imp.
Ohio	Lima	August 13	Grading, curbing and paving S. B'w'y with brick or macadam	L. L. Crumrine, Sec'y Bd. Pub. Serv.
Michigan	Ecorse	August 13	Paving and sewering River Road	Geo. Jerome, Village Engineer.
New York	Brooklyn	August 14, 11 A.M.	Regulating, grading, paving, etc., various streets	Bird S. Coler, Boro. Pres.
New York	New York	August 14, noon	Repairing asphalt pavements along North and East Rivers, etc.	J. A. Bensel, Comr. of Docks.
Ohio	Columbus	August 14	Improving portions of six or more streets	Edw. F. McGuire, Sec'y Bd. Pub. Ser.
New Jersey	Elizabeth	August 15, 8:30 P.M.	Constructing 1,480 sq. yds. Telford pavement, 3,230 yds. trap block, 1,720 lin. ft. new 4-ft. flag, 1,390 sq. yds. trap block gutters, 2,340 ft. new curb, excavating, etc	N. K. Thompson, Street Com'r.
Illinois	Cairo	August 15	Paving 51,646 sq. yds. Washington Ave. with brick	W. B. Thistlewood, City Engineer.
New York	New York	August 15	Laying cement walks, Rainey and Ashmead Parks, Boro Queens.	Moses Herrman, Pres. Park Bd.
Wisconsin	Appleton	August 15	Paving ten blocks with brick	C. H. Gillett, City Engineer.
Washington	Olympia	August 16, 10 A.M.	Clearing, grading, etc., Road No. 8, 6.15 miles, 2 counties	Jos. M. Snow, Sec'y State H'y Bd.
Indiana	Covington	August 16	Constructing Glasscock gravel road, 11,820 ft. long	Wm. B. Gray, County Auditor.
Ohio	London	August 16	Constructing cement sidewalks, curbs and gutters on High St	John W. Byers, Village Clerk.
Ohio	Cleveland	August 17, 11 A.M.	Repairing pavement on Wooster pike, Middleburg & Strongsville twps	A. B. Lea, County Engineer.
Ohio	Ottawa	August 17	Bldg. 6 roads, inc. 30,000 cu. yds. crushed stone, excavation, tile, etc	J. T. Maidlow, County Surveyor.
Alabama	Huntsville	August 17	Laying vitrified brick pavement around Public Square	R. E. Smith, Mayor.
Indiana	Bedford	August 17	Constructing 8,217 ft. macadamized road	W. G. Owens, County Auditor.
Ohio	Steubenville	August 19, noon	Paving Seventh Street with brick	T. W. Vance, Clk. Bd. Pub. Service.
New Jersey	Westfield	August 19, 8 P.M.	Excavating 555 cu. yds.; laying 3,837 sq. yds. 6-in. macadam and 227 sq. yds. cobble gutters	A. W. Vars, Town Surveyor.
Ohio	Cleveland H'ts	August 20, noon	Grading, macadamizing walks, etc., Fairmount Boulevard	F. A. Pease Eng. Co., Cleveland.
Washington	Aberdeen	August 21	Clearing, grubbing, storm water gutters and outlets, graveling, concrete bulkheads, etc.; cost, $185,000	H. W. Troutman, City Engineer.
Ohio	Carrollton	August 21	Paving 11,000 sq. yds. vit. brick, 4,000 ft. straight curb, etc., draining	S. Q. Morrow, Clerk of Council.
Ohio	Newark	August 22	Constructing, complete, 4.32 miles of macadam road	H. L. Maddocks, County Engineer.
Wisconsin	Ashland	August 22	Paving Seventh street with asphalt	Board of Public Works.
Ohio	Dillonvale	August 23, noon	Paving four streets with brick or block, inc. 9,529.64 sq. yds. 1772.6 ft. stone or concrete curb, 2,851 yds. exc.; 1,124 ft. building stone, etc	A. G. White, Village Engineer.
Ohio	Mt. Gilead	August 23	Constructing Climax Free Turnpike	W. C. McFarland, County Auditor.
Arizona	Prescott	August 24, 11 A.M.	Constructing roads and walks at Whipple Barracks	Chas. C. Walcott, Jr., Q. M. U. S. A.
Florida	Jacksonville	August 26	Grading, paving, etc., 6,000 sq. yds. vit. paving block	Philip Prioleau, City Engineer.
Maryland	Ft. Washington	August 26	Grading and draining the drill grounds	Constructing Quartermaster.
Florida	Pensacola	August 27, noon	Grading, curbing and paving 170,700 sq. yds. clay or shale block, asphalt, bitulithic, wood block, or macadam and 115,950 ft. concrete curb	T. Chalkley Hatton, Wilm'ton, Del.

Street Improvements—*Continued.*

New Jersey	Hoboken	August 28, 8 P.M.	Repairing 3 sts. with present Belgian block, to new grade	James H. Londrigan, City Clerk.
Missouri	Marshfield	August 30	Constructing 98,000 ft. macadam street, 7,200 ft. stone gutter	W. P. McKnight, City Clerk.
Minnesota	Devil's Lake	September 1	Grading certain streets	The Mayor.
Illinois	Beardstown	September 3	Laying 38,460 sq. yds. brick on concrete; cost, $81,528	C. W. Brown, Jacksonville, Engr.
Ohio	New Philadelphia	September 3, noon	Laying 10,600 sq. yds. brick pavement	Clyde J. Knisely, City Engineer.
Indiana	Evansville	September 5	Large amount of paving in County	Vanderburg County Comrs.

Water Supply

New Jersey	Perth Amboy	August 7, 8:30 P.M.	Furn. 345 lengths 8-in., 260 6-in. B. & S. water pipe	J. G. Burns, Supt. Water Works.
Georgia	Fort Oglethorpe	August 8, 11 A.M.	Constructing deep well and water system at target range	Capt. E. D. Anderson, Q. M. U. S. A.
New York	New York	August 8, 3 P.M.	Complete pumping plant, Forest Park, Boro of Queens	Moses Herrman, Pres. Park Board.
Ohio	Cleveland	August 8	Furn. 5,000 ¾-in. water meters with privilege of 10,000	W. J. Springborn, Pres. Bd. Pub Ser.
Ohio	McComb	August 8	Furn. 125-h.p. boiler, complete, 150 lbs. pressure	Geo. T. Smith, Clk. Bd. Pub. Serv.
New Jersey	Fort Hancock	August 9, 2 P.M.	Installing filtration plant	M. N. Falls, Constr. Q. M. U. S. A.
Minnesota	Belleplaine	August 12, 8 P.M.	Complete water works system, inc. steel tower and tank, distributing pipe line system, geared deep-well gasoline engine, and pump and brick building	Oscar Claussen, St. Paul, Con. Eng'r
Kentucky	Louisville	August 12	Deep well and pumping apparatus in Federal Building	W. G. Dearing, Custodian.
Ohio	St. Bernard	August 12	Labor and material for installing 10-inch well	Wm. J. Voller, Village Clerk.
Ohio	Columbus	August 13, noon	Constructing reservoir in Summit County, inc. 17,000 cu. yds. embankment; 24,000 ft. B.M. of lumber, 400 cu. yds. concrete masonry	Chas. E. Perkins, Ch. Eng'r State Board of Public Works.
Nova Scotia	Halifax	August 13, noon	Supplying 2,900 ½-in. and 100 ¾-in. water meters	J. J. Hopewell, Clk. of Works.
Ohio	Hamilton	August 13	Sand pumping driven wells, placing stop valves in branch pipes; driving wells, two 4,000,000-gal. duty centrifugal or turbine pumps, two 100-h.p. a. c. electric motors, etc.; 1,000 ft. electric pole line; furn. and laying 24-in. discharge pipe, etc.	John W. Hill, Cincinnati, Eng'r.
New York	New York	August 14, 2 P.M.	Furn. repair and renewal supplies for pumping stations	John H. O'Brien, Water Com'r.
Illinois	Lombard	August 19, 7:30 P.M.	Furn. and erecting 60,000-gal. steel tank on steel tower	W. S. Shields, Chicago, Engr.
California	Sacramento	August 19, 8 P.M.	Competitive plans and specifications for constructing filtration plant	M. J. Desmond, Clk. Bd. Trus.
Arkansas	Russellville	August 20, 8 P.M.	Labor and material for building complete water works system	R. M. Newport, Chm. B. W. Com.
Massachusetts	Springfield	August 21, 2 P.M.	Constructing intake and tunnel, Contract No. 1	Hazen & Whipple, N. Y. City, Con. Engineers.
New Jersey	Fort Hancock	August 21, 2 P.M.	Furnishing and placing "Cook" strainer in deep well	Capt. M. N. Falls, Q. M., U. S. A.
Pennsylvania	Philadelphia	August 22, noon	Constructing preliminary filters at Torresdale, Contract No. 102 and Roxborough pipe extension system, Contract No. 108	Geo. R. Stearns, Dir. Pub. Works.
Ohio	Ashland	August 26	Furn. and installing pumping plant of high duty horizontal cross compound pumping engine, 1,500,000 gals. and two 125 h.p. internal furnace boilers, and all other apparatus	A. P. Black, Village Clerk.
Ohio	Cincinnati	August 27, noon	Laying 2,600 ft. 8- and 12-in. c. i. water mains, 3 sts., etc.	Elmer G. Prior, Clk. Comr. W. W.
North Dakota	Carrington	September 2, 2 P.M.	Constructing steel stand pipe and foundation for waterworks	Loweth & Wolfe, St. Paul, Minn., Engineers.
Manitoba	Winnipeg	September 3, noon	Constructing general works and equipment for Hydro-Electric Works and Station at Point du Bois; transmission line to city and Receiving Transformer Station in Winnipeg	M. Peterson, Sec'y Bd. of Control.
Louisiana	New Orleans	September 4, 3 P.M.	Hauling and laying 250 miles 4 to 30-in. c. i. water pipe, aggregating 26,000 tons	Geo. G. Earl, Gen. Supt. S. & W. Bd.
Kentucky	Louisville	September 8, noon	Pumping engine, boilers, etc., for Louisville Water Co.	S. Zorn, President.
Philippine Is'ds.	Manila	September 14	Valves and sluicegates for use in gravity water supply	J. F. Case, Chief Engineer.

Sewerage

Minnesota	St. Paul	August 8, 11 A.M.	Constructing sewers in University Ave. and Jessamine St.	R. L. Gorman, Clk. Bd. Pub. Wks.
Massachusetts	Milford	August 8, 8 P.M.	Bldg. 7,000 ft. 6-12-in. sewers; 800 ft. 8-in. forcemain; concrete pump well and station; furn. 800 ft. 8-in. c. i. pipe; furn. and erecting electric pumping plant, of motors and dir. con. centrifugal pumps	F. A. Barbour, Boston, Engineer.
Virginia	Portsmouth	August 8, 8 P.M.	Furn. 972 ft. 27-in. and 1,034 ft. 24-in. d. s. vit. sewer pipe; 48 ft. 30-in. 36-ft. 24-in. c. i. pipe, etc.	Rescom Sykes, City Engineer.
Wisconsin	Green Bay	August 8	Bldg. 9,000 ft. brick or concrete and 10,000 ft. vit. pipe sewer	W. W. Reed, City Engineer.
Ohio	Defiance	August 8	Constructing sewers in number of specified streets	J. M. Forst, Clk. Bd. Pub. Service.
Michigan	Detroit	August 8	Furn. material and constructing portion Schroeder Ave. sewer	J. J. Haarer, Com'r Pub. Works.
Missouri	Kansas City	August 8	Constructing sewers Dist. No. 176, Sewer Dist. No. 2	E. A. Harper, City Engineer.
Connecticut	New Haven	August 9	Changes in heating plant at Springside Home	J. V. Rattelsdorfer, Superintendent.
Indiana	Indianapolis	August 9	Constructing 10 to 15-in. pipe sewer, Market and Davidson Sts.	Jos. G. Elliott. Pres. Bd. Pub. Wk.
Indiana	Richmond	August 9	Constructing subway and sewer system W. 2d St.; cost, $40,000	C. N. Merrill, Pres. Bd. Pub. Works.
Illinois	Chicago	August 10, 11 A.M.	Bldg. concrete screen covering for screen chamber, etc.	John J. Hanberg, Com'r Pub. Works.
Ohio	Cambridge	August 10	Constructing vit. pipe sanitary sewers, 43 manholes, 8 flush-tanks, etc.	H. P. Woodworth, Pres. Bd. Pub.Ser
South Dakota	Madison	August 12, 9 A.M.	Constructing sewer system at Madison State Normal School	Irwin D. Aldrich, Sec. Reg. Educ'n.
Wisconsin	Marshfield	August 12, noon	Constructing sewer in Sixth Street	M. G. Fleckenstein, City Clerk.
New York	New York	August 12, 2 P.M.	Reconstructing outlet sewers, etc., 42d and 43d sts., N. River	H. S. Thompson, Act. Boro. Pres.
Minnesota	Willmar	August 12, 8 P.M.	Constructing 2,520 ft. 12-in., 1,110 ft. 18-in. pipe sewers	H. Gunderson, City Clerk.
South Dakota	Aberdeen	August 12	Constructing 4,500 ft. 8- to 12-inch pipe sewer	W. T. Raymore, City Auditor.
Ohio	Bucyrus	August 12	Sewer system, disposal plant, etc., at County Infirmary	Chas. Meyer. Clk. Bd. Infir. Dir.
Ohio	Youngstown	August 12	Laying sewer in Walnut Street	W. H. McMillen, Clk. Bd. Pub. Serv.
California	Lincoln	August 13	Constructing sewer system of 3,300 ft. 10-in. sewer, 5,500 ft. 8-in. sewer, 17,000 ft. 6-in. sewer and septic tank	Town Clerk.
Indiana	Evansville	August 13	Constructing main and 2 local sewers; 15 to 10-in. vit. pipe	W. F. Wunderlich, Clk. Bd. Pub. Works.
Indiana	Gas City	August 13	Constructing 3.1 miles sanitary and storm sewers; cost, $24,000.	T. E. Petrie, Marion, Engr.
Idaho	Boise	August 14, 11 A.M.	Constructing drainage system and grading at Boise Barracks	John S. Winn, Q. M. U. S. Army.
California	Oakland	August 14, 11 A.M.	Constructing concrete and iron pipe sewer in Canning street	W. B. Fawcett, Sec'y Bd. Pub. Wks.
Ohio	Columbus	August 14	Constructing sewers in several alleys and portion of Wall street	Edw. F. McGuire, Sec'y Bd. Pub.Ser.
Arkansas	Camden	August 15, noon	Constructing 15,000 feet of sewer	Louis Bauerlein, Sec'y Dist. No. 2.
Arkansas	Arkadelphia	August 15, noon	Constructing 45,280 ft. clay pipe sewer in District No. 1	Theo. Hartman, Little Rock, Eng'r.
New Jersey	Elizabeth	August 15, 8:30 P.M.	Furn. material and laying 4 sewers, inc. 200 ft. 15-in. pipe, 250 ft. 12-in., 760 ft. 10-in., 1,472 ft. 6-in. manholes, etc.	N. K. Thompson, Street Com'r.
New Jersey	Asbury Park	August 17, noon	Constructing 10 miles 6 to 15-in. pipe sewer, manholes, flush-tanks, etc.; also 1,200 ft. 12-in. iron sub-aqueous outlet	Niart Rogers, City Engineer.
Ohio	Norwood	August 17	Constructing receiving basins and airtanks, and laying 4 and 8-in. pipe in Serpentine Ave. to drain Duck Creek to Bloody Run	James A. Stewart, City Engineer.
Ohio	Port Clinton	August 10, noon	Furn. material and building sewer in District No. 9	J. J. Huber, Village Clerk.
New Jersey	Riverside	August 10, 8 P.M.	Constructing sewer system, inc. 10 miles 8- to 24-in. sewers, pumphouse, engines, pumps, well and disposal works	Wm. H. Boardman, Engineer.
Missouri	Webster Groves	August 10, 8 P.M.	Constructing 50,800 ft. 9- to 18-in. pipe sewer, 54 flushtanks, 70,000-gal. septic tank, etc., Dist. No. 1; also 42,800 ft. 9- to 15-in. pipe, 49 flushtanks and sewage disposal plant, 42,000 gals., Dist. No. 2	R. E. McMath Surv. Co., St. Louis.
Missouri	Cape Girardeau	August 10	Constructing 12 miles, 8 to 24-in. pipe sewer, Dist. No. 1	C. C. Hawley, City Engineer.
Ohio	Cleveland H'ts	August 20, noon	Constructing sewers in Fairmount Boulevard	F. A. Pease Eng. Co., Cleveland.
Illinois	Collinsville	August 20, 2 P.M.	Constructing sanitary septic sewer system, District No. 1	J. L. R. Wadsworth, Pres. Board Local Improvement.
Illinois	North Chicago	August 21, noon	Laying sewers and drains at Naval Training Station	Commandant Naval Training Sta'n.
Arkansas	Fayetteville	August 22, 3 P.M.	Furnishing material and constructing sewer system	Burns & McDonnell, Kansas City, Mo
Ohio	Delaware	August 23, 6 P.M.	Constructing sewage disposal plant, Girls' Indus. School	T. F. Dye, Sec'y Bd. Trustees.
Nebraska	Omaha	August 26,	Constructing storm water sewers and appurtenances	
Indiana	Evansville	August 30, 2 P.M.	Constructing Kentucky Ave. sewer, inc. 2,850 ft. 8-ft. rein. concrete sewer; 1,400 ft. 7-ft. 6-in.; 1,400 ft. 7-ft.; 1,220 ft. 6 ft. 6-in., 680 ft. 6-ft.; 1,364 ft. 5-ft. 6-in.; also one egg-shaped brick sewer as above, manholes, etc.	Walter F. Wunderlich, Clk. Bd. Public Works.

Sewerage—*Continued.*

Ohio	New Philadelp'a.	September 3, noon	Laying 4,500 ft. 8-in. pipe sewer	Clyde J. Knisely, City Engineer.
Louisiana	New Orleans	September 11, 3 P.M.	Constructing 110 miles 8- to 27-in. sewer, depth 5 to 17 ft., including 1,230 manholes and 443 flush tanks; 4 contracts	F. S. Shields, Sec'y S. & W. Board

Public Buildings

Alberta	Calgary	August 8	Erecting a City Hall	R. E. Speakman, City Engineer.
Pennsylvania	Spring City	August 9, noon	Erecting institution for feeble-minded and epileptics	J. F. Sherwood, Sec'y Bldg. Com.
Ohio	Lakewood	August 9, noon	Erecting school on Elbur Ave.; separate bids	L. W. Thomas, Cleveland, Arch.
North Dakota	Trolley	August 9	Erecting a 4-room brick school	Wm. Zimmerman, Minot, Arch.
Indiana	Monticello	August 9	Erecting a County Poor Asylum; cost, $31,750	County Commissioners.
New York	West Point	August 10, noon	Installing reinforcing for girder under small library tower	Maj. J. M. Carson, Q. M. U. S. Army.
California	Ontario	August 10	Erecting one-story 160 x 190 brick high school; cost, $40,000	F. S. Allen, Pasadena, Arch.
Texas	Brenham	August 10	Erecting brick school building	C. H. Page, Jr. & Bros., Austin, Arch.
Washington	Pullman	August 10	Constructing recitation building for State College; cost, $125,000	State Bd. Control, Olympia.
Illinois	Chicago	August 12, 11 A.M.	Erecting 2 police stations: separate bids on stone, iron, etc	John J. Hanberg, Com'r Pub. Wks.
Wisconsin	West Allis	August 12, noon	Erecting school; also installing heating and ventilating system	F. Phillips, Jr. Chm. Bd. Pub. Wks.
Iowa	Mason City	August 12, 3 P.M.	Building, complete, U. S. Post Office	James Knox Taylor, Wash., D. C.
New York	New York	August 12, 3 P.M.	Heating, ventilating, electric wiring, etc., various schools	C. B. J. Snyder, Supt. School Bldgs.
Minnesota	Elizabeth	August 12	Erecting 2-story brick school, District No. 37	J. P. Greenagel, Clk., School Dist. 37.
New Hampshire	Durham	August 12	Erecting dormitory at New Hampshire College	John G. Gallant, Bd. Trustees.
New Jersey	Montclair Hei'ts.	August 13, 1 P.M.	Erecting boiler house and heating plant Normal School	Edw. Russ, Chm. Bldg. Com.
Dist. of Col'bia.	Washington	August 14, 10 A.M.	Completing Marine Barracks and officers' quarters	Col. F. L. Denny, Q. M., M. C.
Michigan	Ionia	August 14, noon	Erecting County House for Ionia County	Edwyn A. Bond, Lansing, Arch.
Ohio	Youngstown	August 14	Erecting addition to Children's Home	W. B. Jones, County Auditor.
Ohio	Canfield	August 14	Erecting a tuberculosis hospital	W. B. Jones, Youngstown, Co. Aud.
Pennsylvania	Philadelphia	August 15, 10 A.M.	Constructing addition to Philadelphia Army Depot	Col. F. L. Denny, Q. M., U. S. A.
Illinois	North Chicago	August 15, noon	Constructing 12 additional bldgs. Naval Training Station	Jarvis Hunt, Chicago, Arch.
New York	Albany	August 15, noon	Constructing New York State Normal College, complete	Dr. Andrew S. Draper, Com'r Educ.
Oklahoma	Walters	August 15, 2 P.M.	Constructing ten-room school building	C. T. Loucks, Pres. Bd. Educ.
North Carolina	Bakersville	August 15	Furnishing material and erecting County Court House	H. L. Lewman, Louisville, Ky., Arch.
Wisconsin	Milwaukee	August 15	Erecting an auditorium, according to plans of Ferry & Clas, 419 Broadway	Auditorium Commission.
Indiana	South Bend	August 16	Erecting two fire stations	Wilfred Grant, Fire Chief.
Ohio	Ashland	August 16	Ventilating, heating, plumbing, gas piping, new Walnut St. Sch.	Vernon Redding, Mansfield, Arch.
North Dakota	Minot	August 17	Erecting 2-story school; 34 x 60 ft. for Minot Special School Dist.	Frost & Hosmer, Architects.
Ohio	Wheelersburg	August 17, noon	Heating new and old school buildings	J. B. Fullerton, Clerk School Board.
Kentucky	Frankfort	August 19, noon	Furnishing hardware for new Kentucky State Capitol	Henry B. Ware, Sec'y Bd. Capitol Commissioners.
Illinois	Chicago	August 10, 1:30 P.M.	Boilers and piping, furnaces and grates, Cook Co. Inst. at Dunning	Wm. McLaren, Supt. Public Service.
Minnesota	lexandria	August 10, 3 P.M.	Constructing, complete, U. S. Post Office	James Knox Taylor, Wash., D. C.
Alabama	Montevallo	August 20, noon	Erecting new building and additions Girls' Industrial School	W. E. Spink, Birmingham, Arch.
North Carolina	Lumberton	August 20, noon	Constructing, etc., new County Court House	F. P. Milburn & Co., Wash., D. C., Architects.
Ohio	Athens	August 20, noon	Bldg. additions, alterations, etc., Athens State Hospital	Frank L. Packard, Columbus, Arch.
Illinois	Decatur	August 20, 3 P.M.	Complete construction of U. S. Post Office	James Knox Taylor, Wash., D. C.
South Dakota	Aberdeen	August 20	Erecting a $8,000 normal school	Wm. M. Kenyon, Minneapolis, Minn.
Iowa	Fort Dodge	August 21	Erecting and rebuilding high school building	J. B. Butler.
Mississippi	Jackson	August 22, 3 P.M.	Erecting addition to and remodeling Federal Building	James Knox Taylor, Wash., D. C.
Michigan	Marquette	August 22	Erecting high school; also plumbing and sewage for same	J. D. Chubb, Chicago, Ill., Arch.
New Jersey	Newark	August 23	Installing lighting plant in new City Hall	M. R. Sherrerd, City Engineer.
North Dakota	Bismarck	August 24	Bldg. additions, making repairs; heating, plumbing, Court House	I. W. Healy, County Auditor.
Indiana	Terre Haute	August 25, 9 A.M.	Constructing fireproof Library bldg. for State Normal School	Joshua Jump, Sec'y Bd. Trus.
New Jersey	Trenton	August 27, 3 P.M.	Building 3-story addition to Post Office	James Knox Taylor, Wash., D. C.
Connecticut	Storrs	August 31	Horticultural Hall and greenhouses Com. Agr.; cost, $50,000	
Indiana	Williamsport	August 31	Bldg. new jail, jailer's residence and heating plant for jail and Court House, estimated cost, $18,000	R. L. Winks, County Auditor.
Indiana	Bloomfield	September 3, 2 P.M.	Erecting cell house and cell work, Green Co. Jail	J. W. Gaddis, Vincennes, Arch.
New York	Watertown	September 3, 3 P.M.	Constructing complete, U. S. Post Office	James Knox Taylor, Wash., D. C.
Massachusetts	Quincy	September 4, 3 P.M.	Constructing complete, U. S. Post Office	James Knox Taylor, Wash., D. C.
California	Eureka	September 11	Erecting County Jail with either brick walls and wood floors or concrete throughout; also cell and grating work	Geo. Cussins, Clk. Co. Supervisors.
Pennsylvania	Pittsburg	September 16	Constructing, except elevators, U. S. Marine Hospital	James Knox Taylor, Wash., D. C.

Bridges

Ohio	Zanesville	August 8, noon	Bldg. sub. and superstructure, 1 span 80 ft. long, 18-ft. roadway.	L. E. Brelsford, County Auditor.
Indiana	New Albany	August 8, noon	Erecting bridge over Big Indian Creek at Stillers Ford	Wm. Hanger, County Com'r.
Pennsylvania	Reading	August 9, 10 A.M.	Erecting rein. concrete arch bridge, Boro. Hamburg, with 40-ft. clear span, 8-ft. rise, 2 abutments, 4 wing walls, surmounted with parapet wall, entire length on each side	H. F. Livingood, County Comptroller.
Ohio	Cleveland	August 10, 11 A.M.	Erecting steel concrete bridge and concrete arch culvert	A. B. Lea, County Surveyor.
Dist. of Col'bia.	Brookland	August 10, noon	Erecting concrete steel bridge over B. & O. R. R., Monroe St.	Jay J. Morrow, Engineer, Com'r.
California	Carlotta	August 11, 10 A.M.	Constructing protective work at Yager Creek bridge	Geo. W. Cussins, Clk. Supervisors.
California	Los Angeles	August 12, 2 P.M.	Erecting 2 concrete abutments and timber bridge	C. G. Keyes, County.
Oklahoma	Mangum	August 12	Erecting new bridge and repairing old one; cost, $1,200	
Alabama	Talladega	August 12	Constructing two steel bridges	County Commissioners.
South Dakota	Mitchell	August 12	Constructing six bridges, 2 steel; 4 truss pile	H. B. Anderson, County Auditor.
Ohio	Jackson	August 15, 1 P.M.	Constructing two bridges	I. W. Turner, County Surveyor.
Ohio	Mt. Gilead	August 15	Sub. and superstructure for steel bridge, Westfield twp	W. C. McFarland, County Auditor.
Ohio	Cincinnati	August 16, noon	Repairing culverts on Whiskey Run Road, Specifications, No 636	Fred Dreihs, County Clerk.
Washington	Spokane	August 16, 2 P.M.	Erecting sub and superstructure of bridge over Methon River	Bowerman & McClay, Seattle, C. Eng.
Ohio	Port Clinton	August 17, 11 A.M.	Erecting span 65 ft. long, 16 ft. roadway; also substructure	Henry Paffenbach, County Auditor.
Illinois	Chicago	August 17, 11 A.M.	Furn. and erecting sub and superstructure of draw bridge	John J. Hanberg, Com'r Pub. Wks.
Ohio	Jefferson	August 10, 1 P.M.	Constructing rein. concrete bridge Gates St., Andover Village	J. S. Matson, County Surveyor.
Porto Rico	San Juan	August 20, 10 A.M.	Furn. at dock; furn. and erecting, or erecting only, 3 steel riveted bridges, for Mulas, Higuero and Convento Creeks	I. J. Jiminez, Supt. Pub. Works.
Virginia	Fort Meyer	August 20, 11 A.M.	Constructing Bridge on Military Road	Maj. M. Gray Zalinski, O. M. Gen.
Iowa	Des Moines	August 20	Erecting Locust St. bridge; also removing old one one-half mile.	W.W. Wise, Bd. Bub. Wks.
Ohio	Lebanon	August 24, noon	Erecting 2 spans, 135 each, high truss steel bridge, 16 ft. roadway, pin centers, capacity, 100 lbs per sq. ft.; also substructure, consisting of one new abutment and pier and refacing old abutment	S. A. Stillwell, County Auditor.
North Carolina	Tarboro	September 2	Erecting steel bridge over Tar River; 200 ft. long; 18 ft. wide; 60 ft. draw	J. W. B. Battle, Chm. Co. Com'rs.
Montana	Glasgow	September 4, 2 P.M.	Erecting 150 ft span, combination tubular pier bridge, 16-ft. roadway, 80-ft. approach at one end	W. B. Shoemaker, County Clerk.
Chile, So. A.	Santiago	September 30	Erecting several bridges in Chile	Wessel, Duval & Co., N. Y. City.

Miscellaneous

Nebraska	Fort Omaha	August 8, 11 A.M.	Constructing balloon house, hydrogen gas house, and wireless telegraph station at fort	Maj. Thos. Cruse, Omaha, Q.M.U.S.A.
Ohio	Cleveland	August 8	Completing superstructure of power house for municipal light plant; water tube boiler; super heater and stoker; 275 tons meter manhole, rings and covers; also 5,000 water meters	W. J. Springborn, Pres. Bd. Pub. Ser
New York	New York	August 9, 10 A.M.	Furn. gasoline patrol wagon and two-power launches for Police Department	Theo. Bingham, Police Com'r.
Pennsylvania	Wilkes-Barre	August 9, noon	Building one-horse wagon for Street Department; also making and putting up street signs	B. F. O'Rourke, Chm. St. Com.
North Carolina	Hickory	August 10, 3 P.M.	Constructing concrete rock rein. dam with power house across Catawba River and installing 3,000 h. p. turbine water-wheel and electrical apparatus and transmission lines for lighting and power purposes	M. E. Thornton.
Pennsylvania	Wilkes-Barre	August 12, noon	Furnishing quick-acting aerial hook and ladder truck	G. W. Walker, Chm. Fire. Com.
New York	New York	August 12, 3 P.M.	Constructing tunnel at Bellevue Hospital, connecting building	Myles Tierney, Act. Pres. Trustees.

Miscellaneous—*Continued.*

New Jersey....	Jersey City.....	August 12.....	Collection and removal of ashes and garbage and kitchen refuse from all streets for one or five years from Dec. 1, 1907.....	Geo. G. Bouton, Clk., S. & W., Com's.
New York.....	New York.....	August 13, 10 A.M....	Furn. naval supplies, inc. incandescent lamps, motors, etc.	E. B. Brown, P. M. Gen., U. S. Navy.
Pennsylvania...	Philadelphia....	August 13, 10 A.M....	Furn. incandescent lamps, electrical supplies, etc., navy yard...	Commanding O \ cer
California.....	Oakland.....	August 14, 11 A.M....	Sweeping and cleaning paved sts. by machinery, yr. ending June 30, 1908.....	W. B. Fawcett, Sec'y Bd. Pub. Wks.
Massachusetts..	Boston.....	August 15, noon.....	Bldg. entrance and exit, Washington St. tunnel at Devonshire St.	Boston Transit Commission.
New York.....	New York.....	August 15, 2:30 P.M..	Electric light and power system, City Hosp. Dist. Bl'wells Island	Robt. W. Hebberd, Com'r Charities.
Texas.....	San Angelo.....	August 15.....	Improving the gas plant; inc. new bld., etc.; cost, $50,000.....	San Angelo Gas Co.
New York.....	West Point.....	August 10, noon.....	Furn. iron lamp-posts and lamps for electric street lights.....	Maj. J. M. Carson, Q. M., U. S. A.
Illinois.....	Chicago.....	August 19, 1:30 P.M..	Refrigerating plant, 25-ton at Cook County Hospital.....	Wm. McLaren, Supt. Pub. Serv.
Nebraska.....	Tecumseh.....	August 19.....	Constructing electric light plant, to cost $20,000.....	John Martz Seward, Engineer.
Ohio.....	Jefferson.....	August 19.....	Straightening the water course in Trumbull County.....	J. S. Malson, County Surveyor.
Washington....	Bremerton.....	August 24, 11 A.M....	Constructing concrete quay wall at Puget Sound Navy Yard....	Navy Dept., Washington, D. C.
Ohio.....	Youngstown.....	August 26.....	Constructing swimming pool in East End Park.....	W. H. McMillan, Clk. Bd. Pub. Serv.
California.....	San Francisco...	August 29, noon.....	Furn. motors, air compressor, conduit, wire, etc., U. S. P. O.....	Custodian, Federal Building.
Pennsylvania...	Lebanon.....	August 31, noon.....	Lighting streets with 150 2,000 c.p.; also 150 incandescent 24 c.p. lights, for 5 yrs. every night, and all night.....	Geo. D. Krause, Chm. Police Com.
Manitoba.....	Winnipeg.....	September 3, noon...	Supplying and erecting portions of equipment for hydro-electric works, transmission lines, and receiving transformer station.	M. Peterson, Sec'y, Bd. Control.
India.....	Calcutta.....	December 31.....	Lighting town by electricity, gas, oil, or other method; now lighted by 9,300 gas lamps of 24 c.p. and 2,400 c.p.oil lamps.....	Municipal Council.

STREET IMPROVEMENTS

Birmingham, Ala.—Council has passed ordinances for paving Twenty-sixth street with bitulithic, lay curb, etc., cost $29,500; paving Twenty-eighth street with bitulithic, vitrified brick gutters on concrete base, and granite curb, cost $14,000; grading Twenty-sixth street, setting granite curb stone and paving sidewalks with artificial stone; also paving and curbing, two contracts, to cost $8,000 and $900.—George B. Ward, Mayor.

Mobile, Ala.—Bids will shortly be awarded for paving contracts approximating $210,000, to include the paving of Government, Dauphin, St. Joseph, Warren and Royal streets and Smith's alley.—P. J. Lyons, Mayor; Wright Smith, Chief Engineer, Board of Public Works.

Montgomery, Ala.—Bonds, $22,200, will be issued for paving and otherwise improving sidewalks on the north side of Fenley avenue, from Hull street to Norman Bridge road; and $3,000 for the west side of Holt street, from Nash to Day street.—W. M. Teague, Mayor.

Oakland, Cal.—Council has ordered the improvement of a number of streets by grading, paving, constructing sewers, etc.—Leo J. McCarthy, Superintendent of Streets.

Oakland, Cal.—Supervisor Bridge will soon submit to the Supervisors a proposition to complete the foothill boulevard, from the western terminus, 1,500 feet west of High street, to the city limits; the cost will be about $30,000, and the Supervisors will be asked to appropriate $20,000.

San Diego, Cal.—As soon as City Engineer Crowell receives from Geo. W. Cooke the profile drawing of the boulevard leading to the proposed bridge over Los Penasquitas river he will go ahead with plans and specifications on which bids will be called; the National Bridge Company will also submit plans; bids will be called for within a short time for the construction of the bridge, for which the city has appropriated $7,200.

Smyrna, Del.—The Street Commissioner has been directed to have the principal streets of the city macadamized.

Columbus, Ga.—City Council will probably consider the construction of subway on East Eleventh street, to cost $50,000. It is proposed that Council, County Commissioners and railroads share cost.

Rome, Ga.—About $225,000 will be expended for paving.—J. N. Hazlehurst, Rome, Engineer in Charge; J. R. Cantwell, City Clerk.

Beardstown, Ill.—Bids will soon be received for street paving, at a cost of about $80,000.

Quincy, Ill.—Council has passed an ordinance to pave Tenth street, from Oak to Sycamore streets; estimated cost, $25,581.

Lawrenceburg, Ind.—Bids are being received for construction of cement walk, paving and combined curb and gutters in Third, Maine and Mill streets.—J. F. Frazier, City Clerk.

Marion, Ind.—The Board of Public Works has decided to pave certain portions of Bee street.—Address City Clerk.

Lafayette, Ind.—Bids will soon be asked by the Board of Public Works for grading, graveling, constructing brick gutters, cement curb and sidewalks in Ball and Eleventh streets.

South Bend, Ind.—Bids are being received for paving various streets and alleys with brick, macadam and asphalt, including concrete curbs, gutters and cement walks.—M. H. McInerry, Chairman, Board of Public Works.

Bay City, Mich.—The Board of Public Works has ordered the construction of a large number of cement sidewalks.—G. Hini, Chairman; C. J. Barnett, Secretary.

St. Paul, Minn.—The Board of County Commissioners will spend $50,000 this summer and fall for macadamizing roads.—E. G. Krahmer, County Auditor.

Butte, Mont.—Council is arranging to construct about 33 miles of cement sidewalks.—Address City Clerk.

Lewiston, Mont.—The city will sell $15,000 5 per cent., 20-year street bonds at auction, August 15.—M. D. Kimdell, City Clerk.

Hornell, N. Y.—The proposition to issue bonds for paving purposes carried.

Lyons, N. Y.—The matter of issuing $25,000 bonds to aid the construction of viaduct at Geneva street will be submitted to the vote of the people.

Alliance, O.—The Provident Savings Bank and Trust Company of Cincinnati has purchased $21,000 4 per cent. street improvement bonds for $21,027.50.

Canal Dover, O.—The ordinance to pave several streets and to construct sewers therein has passed its final reading; plans will be prepared and bids invited.

Fostoria, O.—Railroad street is to be improved by macadamizing; plans for the improvement will be immediately prepared and bids invited.

Fremont, O.—The ordinance to pave Washington street will pass Council shortly.

Hamilton, O.—Council has ordered the improvement of Seventh and Dayton streets by paving; a bond issue of about $42,000 will be authorized for these improvements; the Engineer has presented plans and estimate of the cost of paving Black street, amounting to about $7,000.

Piqua, O.—Council will take up the question of paving West High, South Main Watter, Ash, Green, North, Broadway and South Wayne avenues. A comprehensive plan is under way for the construction of a system of sidewalks throughout the town; cement will be used.—H. E. Whitlock, City Engineer.

Portsmouth, O.—Bids will be received, August 22, for $10,000 street improvement bonds; $3,000 street, $1,750 street improvement bonds, $6,000 sewer bonds, $25,000 street improvement bonds, $4,500 street improvement bonds, $30,000 City Hospital bonds, $8,500 street improvement bonds; interest, 4 per cent.—Fillmore Musser, City Auditor.

Youngstown, O.—The Board of Public Service will probably pave East Federal street with brick, instead of asphalt; James McCarren has bid $9,187 on this work. Bids will be received, August 12, for the following bonds: $1,225 McKinzie street sewer bonds; $13,315 Ohio avenue paving bonds; $8,300 North Heights avenue paving bonds; $20,570 Fifth avenue paving bonds; $1,330 Florence avenue grading bonds; $1,320 Butler avenue grading bonds; interest, 6 per cent.—Wm. I. Davies, City Auditor.

Zanesville, O.—Council has authorized the pavement of the driveways leading to Woodlawn cemetery; ordinances have also been passed for improving half a dozen alleys and streets by paving and sewering, plans for which will be presented soon and bids invited.

Lawton, Okla.—Arrangements are being made to expend $40,000 in street improvements.—A. Talmadge, Street Superintendent.

Oklahoma City, Okla.—Council is arranging to pave certain portions of California avenue.

Baker City, Ore.—The City Engineer has been directed to prepare plans and specifications for improving certain streets, with sidewalks and sewers.

Houston, Tex.—Bids will be received August 12, for the purchase of $500,000 Harris county road and bridge bonds.—John B. Ash, County Auditor.

Tyler, Tex.—The city sold to the State Board of Education $15,000 5 per cent., 30-year bonds on the basis of 4 per cent. and accrued interest; the proceeds will be used to pave a 50-foot street around the Public Square and other paving.

Seattle, Wash.—Bids will soon be asked by the Alaska-Yukon-Pacific Exposition, Frank P. Allen, Jr., Director of Works, for about 250,000 cubic yards of grading; bids will be asked during the winter for road work, curbing, guttering, etc.

Morgantown, W. Va.—Bids will be received, August 12, for the purchase of $65,000 5 per cent., 10 to 20-year sewer and street improvement bonds.—I. N. Lucas, Mayor.

SEWERAGE

Birmingham, Ala.—Council has ordered that sanitary sewers be constructed, at a cost of $5,000.—George B. Ward, Mayor.

Lincoln, Cal.—The Town Trustees have adopted specifications for a sewerage system.

Wilmington, Del.—The proposed sewer to be constructed in the lower end of the Ninth Ward will be of concrete, and cost about $25,000; it will be built by day's work.—Alex. J. Taylor, Engineer-in-Charge of Sewers.

Joliet, Ill.—City Engineer Stevens is at work drafting plans for a sewer system for that part of the First Ward bounded on the north by Liberty street, on the south by Jackson street, on the east by Spring creek and on the west by Collins street.

Litchfield, Ill.—The Board of Improvement has decided to build a single ring sewer, and will soon ask for bids for its construction.

Gas City, Ind.—Bids will be called for in a short time by the City Clerk for the construction of a general sewer system, to cost about $33,500.

Hammond, Ind.—The East Chicago City Council will expend $500,000 on a new sewer system for Indiana Harbor, which is part of East Chicago; the sewer is to be reenforced; Council has also authorized the paving of four streets, at a cost of $150,000.

Tipton, Ind.—Council has ordered plans and specifications completed and will soon ask for bids for the construction of a sanitary sewer; estimated cost, $30,000.

Lafayette, Ind.—Bids will soon be asked by the Board of Public Works for the construction of the Congress street sewer; estimated cost, $10,000.

Iowa City, Ia.—The City Engineer is preparing plans for additional sewers.—Address City Clerk.

Omaha, Neb.—The City Engineer has been directed to prepare plans for the system of sewers from Sixteenth and California streets to Twenty-fourth and Dodge streets.—Andrew Rosewater, City Engineer.

Caldwell, N. J.—Council is considering the question of constructing a sewerage system.

Jersey City, N. J.—The Board of Finance has appropriated $6,500 for protection of outlet sewer of Manhattan avenue, at the point where it passes Erie tunnel and open cut.

Madison, N. J.—An election will probably soon be held to vote on the question of constructing a sewerage system and disposal plant, to cost about $125,000.

Riverside, N. J.—Wm. H. Boardman, 427 Walnut street, Philadelphia, Pa., is engineer for the proposed sewage purification plant, which will cost about $70,000.

Highland Falls, N. Y.—The Village Trustees have engaged Knight and Hopkins, of Rome, to prepare preliminary plans for a trunk sewer.

Chagrin Falls, O.—Resolution to purchase real estate for the construction of a sewerage disposal plant has passed Council.—S. P. Harris, Mayor.

Eaton, O.—A bond issue of $125,000 has been voted for a storm and sanitary sewerage system.—A. L. Reid, City Engineer.

Ironton, O.—The cost of constructing the Ellison avenue sewer is estimated at $40,000, and the matter of its construction has been referred to the Board of Public Service.

Medina, O.—Seasongood & Mayer, of Cincinnati, have purchased $23,000 5 per cent., 14 to 27-year sewer bonds, at a premium of $20.

Youngstown, O.—The city will build a sewage disposal plant costing $150,000 at once.—F. M. Lillie, City Engineer.

Enid, Okla.—Council will probably issue $100,000 bonds for the construction of storm water sewer, and for other purposes.

Allegheny, Pa.—Plans have been ordered for sewage filtration plant for the city.—Address City Clerk.

Allegheny, Pa.—Simon Crischner, of the Department of Charities of this city, has directed an engineer to prepare plans for the projected sewage disposal plant for city home and insane asylum at Claremont.

East McKeesport, Pa.—The Town Council has authorized the construction of 12-inch sewers in three or more streets.—W. C. Gillis, Burgess.

St. Mary's, Pa.—Bids will probably be called for in a short time for a sewerage system, to cost about $60,000.—Alex. Potter, of New York, N. Y., and T. Chalkley Hatton, Wilmington, Del., Consulting Engineers.

Seattle, Wash.—Bids will be asked shortly by the Alaska-Yukon-Pacific Exposition, Frank P. Allen, Jr., Director of Works, for constructing sewerage and water works systems; estimated cost, $50,000.

Spokane, Wash.—A new branch sewer 4 or 6 feet in diameter, to take the outflow of all present trunk lines, is considered.—Commissioner of Public Works, W. T. Omo.

Kankauna, Wis.—Plans are now being prepared by G. P. Hawley, of De Pere, for 3,100 feet of 10 to 30-inch sewers.

De Pere, Wis.—G. P. Hawley, of De Pere, is preparing plans for 2,000 feet of 8 to 15-inch pipe sewers.

Watertown, Wis.—An ordinance has been passed authorizing an issue of $7,500 4 per cent. bonds for the construction of sanitary sewer.—Frank S. Weather, City Clerk.

Yorkton, Sask., Can.—A sewerage system will soon be constructed, including compressed air plant; cost, $60,000.

WATER SUPPLY

Brundidge, Ala.—The city is in the market for water works material.—A. J. Stewart, Engineer-in-Charge.

Little Rock, Ark.—Water mains will be extended to furnish water to factories in the suburbs.

Lamar, Col.—A gravity water works system from Clay creek, 14 miles south of Lamar, will probably be installed; estimated cost, $150,000.

Manchester, Fla.—A $10,000 water works system will be built.

Atlanta, Ga.—Council will take prompt action on the completion of the new reservoir at Hemphill station.—W. R. Joyner, Mayor.

Council Bluffs, Ia.—The Water Works Company has been ordered to lay 500 feet of 6-inch water mains in Twelfth street, 10 hydrants, etc.

Des Moines, Ia.—A force of engineers will begin shortly on plans for expending $500,000 for improving water system.—Address City Clerk.

Fort Scott, Kan.—It is proposed to build another reservoir.

Louisville, Ky.—The Board of Water Works has decided to expend $250,000 for pumping engine to be used at the reservoir.—Address City Clerk.

Bangor, Me.—The Water Board has accepted plans for constructing sedimentation basin at the pumping station, and will lay 1,385 lineal feet water pipe on the extension of Maple street.

Arlington, Mass.—The city has appropriated $10,000 to renew the cement-lined water mains.

Pittsfield, Mass.—The Board of Aldermen has passed an order appropriating $150,000 for the enlargement of the intake reservoirs of Sackett, Hathaway and Mill Brooks, also build new dam to increase city water supply.

Wareham, Mass.—A water works system will probably be constructed; it is proposed to lay 8-inch main from wells at Tihonet, constructing pumping station, laying 10-inch pipe and erecting standpipe, 20x100 feet, with capacity of 240,000 gallons; estimated cost, $65,000.

Auburn, Neb.—Burns & McDonnell, Kansas City, Mo., are preparing plnas for a water system, estimated to cost $70,000.—Address City Clerk

Franklin, Neb.—An election will be held, August 26, to decide the question of issuing $17,000 bonds for the construction of water system.

Omaha, Neb.—L. M. Holman, of St. Louis, and E. J. Colaman, of Chicago, are preparing estimates for the Water Board for a complete system of water works.

Woodbury, N. J.—Council has under consideration plans for water system; estimated cost, $25,000.

Bemus Point, N. Y.—A Water Commission consisting of Fred Braker, John O. Johnson and O. W. Brownell have been selected to have charge of constructing water works; probable cost, $15,000.

Lestershire, N. Y.—The Water Commissioners are considering sinking well.

Roswell, N. M.—It is proposed to construct a water system.

Massapequa, N. Y.—A $500,000 water supply system will probably be built.

Moncton, N. B.—The water works system will be improved and extended; cost, $18,000.

Shelby, N. C.—Bids will be received, September 2, for the purchase of $100,000 water and sewerage bonds.—Address City Clerk.

Ashtabula, O.—The Ashtabula Water Company, of which B. B. Seymour is one of the incorporators, expects to proceed with the installation of a filtration plant, and the purchase of pumps, mains and other necessities for the water works plant.

Bellaire, O.—A $10,000 additional bond issue will be authorized for purchasing more pumps for the Water Works Department; it was proposed to purchase a smaller structure, but now a $40,000 pump is to be bought.

Elmore, O.—Bonds have been voted for a water system.—Address City Clerk.

Portsmouth, O.—The Water Works Commission has selected the site for the proposed reservoir at the head of Brewery Hollow; Engineer Lawrence Patterson has commenced preliminary surveys.

Wilmington, O.—J. C. Martin, General Manager of the Wilmington Water and Light Company, announces that the company has decided to purchase another boiler of 600-horsepower capacity to be installed before winter.

Youngstown, O.—The Special Councilmanic Committee will report against the Berlin Township water supply as being unsuitable and will recommend an independent domestic source; Engineer Snow estimates the cost of a water supply at $400,000.

Guthrie, Okla.—An election will be held, August 20, to decide the question of issuing $40,000 in bonds for extending water system and construct a filtration plant.—Address City Clerk.

La Grande, Ore.—Surveys are being run for constructing water works from Beaver Creek; estimated cost, $160,000.

Redmond, Ore.—A water works system will probably be installed; the plans call for 400,000-gallon tank, 40 feet high, and water will be pumped into tank by gasoline engine.

Reading, Pa.—A Council Committee has recommended the appropriation of $500,000 for immediate filtration of the Mander creek and Bernhart water supplies.

Dickinson, Tenn.—The matter of issuing $20,000 water works bonds will be submitted to a vote of the people.

Memphis, Tenn.—The Harris Trust and Savings Bank has purchased $150,000 4 per cent. water bonds.

Petersburg, Tenn.—It is proposed to build a water system.

Dallas, Tex.—The reservoir capacity will be enlarged.—S. J. Hay, Mayor.

De Leon, Tex.—An issue of $6,500 5 per cent. water works bonds has been authorized.—Address City Clerk.

Quincy, Wash.—The Water Works Committee is arranging to secure a water supply from artesian wells.—Address City Clerk.

Cheyenne, Wyo.—Plans for rebuilding the water system are being prepared by C. C. Carlisle, City Engineer.—P. S. Cook, Mayor.

Montreal, Que., Can.—Council is considering the expenditure of $2,000,000 for water supply improvements.

Hamilton, Ont., Can.—The city has applied for permission to extend water works system; cost, $6,500.

LIGHTING AND ELECTRICITY

Lake City, Fla.—John D. Carley is preparing to develop water power on the Suwanee river, near Lake City.

Calhoun, Ga.—The city has voted $12,000 electric light and water bonds.—C. W. Watts, City Clerk.

Coeur d'Alene, Ida.—Preparations are being made to install electric power at the Alhambra mine, in the Coeur d'Alenes.

Hazleton, Ind.—Petitions are being circulated here requesting the Town Council to take legal steps to get a municipal electric light plant.

Wrentham, Mass.—A second election will be held to vote on the question of establishing a municipal electric light plant.—D. T. Stone, Town Clerk.

Hancock, Mich.—Plans have been prepared by E. T. Skyes, of Minneapolis, Minn., for the proposed municipal light plant.

Jackson, Mich.—The Michigan Power Company proposes to build a line to Charlotte and to furnish street lighting.

St. Paul, Minn.—The awarding of contract for furnishing three new boilers for the heating and power plant at the State Soldiers' Home has been placed in the hands of the Executive Committee by the Home Board, with power to act.

Carrollton, Miss.—The Carrollton Electric Light and Power Company's plant was destroyed by fire; loss, $10,000.

Fall City, Neb.—Bonds have been voted for the construction of light plant.—Address City Clerk.

Newbern, N. C.—The city will expend $14,000 on purchase of an incandescent dynamo engine and other equipment for the electric light plant.—C. F. Watson, Manager.

Aiken, S. C.—The Anderson shoals, one of the best water powers in the State, located on Little Horse creek, in this section, has been purchased by the Carolina Light and Power Company, a corporation doing a large business in this city and in the county, and work will commence soon on the erection of a dam and other work for developing the power; an enormous power will be furnished; a large power plant, furnishing electrical power, will be erected.

Aberdeen, S. D.—C. F. Freehauf, of Cresco, Ia., will make a proposition to Council to establish an electric plant.

Raymond, Alta., Can.—The town will install an electric light plant and make improvements in its water system.

FIRE EQUIPMENT

Fort Wayne, Ind.—The Board of Public Works is preparing to expend $9,000 in improving engine house No. 3.

South Bend, Ind.—Council has directed plans and specifications for two new hose houses to be prepared, one on South Michigan street, and the other at Sample and Arnold streets.—Address City Clerk.

Burlington, Ia.—Bids will be received, August 19, for the purchase of $40,000 4 per cent. fire and police station bonds.—R. Kroppack, City Auditor.

Des Moines, Ia.—Council is arranging to rebuild engine house No. 4.—Address Fire Chief.

Binghamton, N. Y.—The Board of Fire Commissioners proposes to establish a paid Fire Department; it is proposed to purchase a smaller truck.

Kenton, O.—The Board of Public Safety has decided to erect a $12,000 building for the Fire Department.

Enid, Okla.—Council is arranging to issue $100,000 bonds for the improvement of the fire protection of the city.—Address City Clerk.

Morgantown, Pa.—Council has authorized the purchase of 1,000 feet of hose.—A. S. Hayes, Chief of Fire Department.

El Paso, Tex.—The city has purchased a site for the erection of an additional fire station.—Address City Clerk.

PUBLIC BUILDINGS

Garrett, Ill.—The citizens have voted $50,000 bonds for erecting a school house.—Address City Clerk.

Joliet, Ill.—Bids for erecting the new building on the grounds occupied by the Roosevelt school were received as follows: J. G. Wilhelmi, $81,973; Honson & Peterson, $96,900; Henry Latz, $82,528; W. H. Roney, $94,500.

Ft. Dodge, Ia.—The School Board is preparing to issue bonds for the erection of high school.

Plaquemine, La.—Bids will be received, August 16, for the purchase of $30,000 school bonds.—C. J. Brown, Secretary.

Wildwood, Minn.—Bids will be received, August 17, for the purchase of $8,000 6 per cent. school bonds.—John Bursack, Town Clerk.

Belhaven, N. C.—Bids will be received for the purchase of $15,000 6 per cent., 20-year school bonds.—R. W. Lucas, Secretary.

Sabina, O.—Bids will be received, August 12, for the purchase of $40,000 school bonds.—W. H. Dakin, Clerk.

Hartsville, S. C.—Bids will be received, September 20, for the purchase of $25,000 5 per cent., 20-year district No. 22 school bonds.—M. S. McKinnon, Chairman.

Bowie, Tex.—The citizens have voted $37,000 bonds for the erection of school house.—Address City Clerk.

San Antonio, Tex.—Five new school houses will be built, also seventeen additions to existing buildings, from a $200,000 bond issue of the San Antonio Independent School District. C. H. Bertrand, Attorney, and Nelson Lytle, Attorney of the School Board, having disposed of the bonds to the State Permanent School Fund.

Teague, Tex.—The citizens have voted $10,000 bonds for school purposes.—Address Clerk of the Board.

STREET RAILWAYS

Americus, Ga.—The American Railway Company has received charter to build road 40 miles long.—A. W. Smith and G. M. Eldridge, Incorporators.

Atlanta, Ga.—The Atlanta and Carolina Traction Company has been incorporated, with capital of $5,000,000, for the purpose of building a line from Atlanta to Augusta, Ga., a distance of 100 miles.—N. P. Edgeton, Secretary.

Columbus, Ga.—The Columbus Railway Company is preparing to extend its lines to the East Highlands.

Fitzgerald, Ga.—A syndicate of local and foreign capitalists has made application to Council for a franchise for operating an electric car line in Fitzgerald and to nearby towns.

Tiffon, Ga.—A franchise to build an electric street railway has been granted to P. L. Thermon, J. W. Myers, and M. W. Banks.

Litchfield, Ill.—The McKinley Traction Company has decided to build a power plant at this place.

Evansville, Ind.—The Evansville & Eastern Traction Company proposes to extend its line through St. Meinrad and Hammond township; estimated cost, $14,000.

Gary, Ind.—The Gary and Interurban Railway Company has been incorporated, with capital of $400,000, by F. N. Gavit, C. B. Manbec, W. E. Schrade and others.

Winterset, Ia.—The Des Moines and Creston Interurban Railway Company proposes to issue $500,000 bonds for construction purposes.

Traverse City, Mich.—The Carter Construction Company of Chicago will ask for a street railway franchise, it being proposed to build about eight miles of track in the city this season and an interurban road to Elk Rapids next year, while the terminal will be Petoskey.

Hattiesburg, Miss.—The Hattiesburg Traction Company is preparing to increase the capital stock to $500,000 and to issue bonds. —H. A. Comp and S. E. Travis, Directors.

Rochester, N. Y.—The Rochester Railway Company has petitioned Council to construct, maintain and operate a branch on St. Paul and other streets.—Lewis D. Clements, City Clerk; J. C. Collins, Secretary, Railway Company.

Arapaho, Okla.—The city authorities of Arapaho and Clinton have granted a franchise to Charles Goodwin, M. L. Holcombe and H. Smith, giving them the right to construct, operate and maintain a system of electric street cars in those towns.

Guthrie, Okla.—The El Reno Railway, which proposes to build an interurban line from Oklahoma City to Geary, by way of El Reno, a distance of 50 miles, at a cost of $100,000, has been granted a charter; the company is capitalized at $100,000, and its main offices will be in El Reno.—J. W. Mansy, of Oklahoma City, John Maney, H. Schoefer and Henry Dittman, of El Reno, Incorporators.

Spartanburg, S. C.—J. J. Honnon, of New York, is interested in constructing a trolley line from Spartanburg to Gaffney, and thence to Blackburg.

Denton, Tex.—Plans for an interurban line from Ft. Worth to Denton and from Denton to Gainesville via Slidell have been practically completed.—J. B. Doyle, of Slidell, is interested.

Ft. Worth, Tex.—Plans are being perfected to build an interurban electric railway from Ft. Worth to Mineral Wells.

Paris, Tex.—The Texas Midland Railway Company, operating a line 124 miles long from Paris to Ennis, proposes to convert the road from steam to electricity.—E. H. R. Green, President.

San Angelo, Tex.—Council is considering a petition presented by E. N. Daniel and T. Rosenbaum, asking for a franchise for an electric street railway line.

Tyler, Tex.—A railroad will be built from Tyler to Canton, Vanzandt County, a distance of 40 miles, and from there to Fort Worth and Dallas.

Salt Lake City, Utah.—The Utah Light and Railway Company has been granted a franchise to make improvements and extensions on its line; about $3,000,000 will be expended.

Walla Walla, Wash.—The Mayor is in favor of a municipal lighting plant; power could be secured from a water right secured by Swain and Evans, of Freewater, on the North Fork of the Walla Walla river.

Katalla, Alaska.—The Cooper River and Northern Traction Company is planning to build an electric plant; the power will be generated from a 50-foot fall in the Cooper river; another plant will be built at Abercrombie Rapids, 50 miles above Katalla.—C. E. Hawkins, Seattle, Wash., Chief Engineer.

BRIDGES

Chicago, Ill.—Bids for a $100,000 Ashland avenue bridge over Bubbly creek have been asked; City Bridge Engineer Pihlfeldt wants to put in a temporary pontoon bridge while the new one is being built.

Kappa, Ill.—Arrangements are being made to build a bridge across the Mackinaw river at this place.

Pekin, Ill.—Several bridges in Tazewell County have been destroyed by flood; Tazewell County will be asked to stand one-half the expense of repairing or replacing the bridges, the other falling on the township in which they are situated.

Wabash, Ind.—Council has under consideration two sets of plans prepared by City Engineer Will Fowler, for bridge 420 feet long across the Wabash river at Huntington street; the plan is to have the Council act upon the kind of bridge desired, and its location as required; then the plans and specifications will be presented to the County Council; the County Council will probably act on the plans in September.—William Fowler, City Engineer.

Iola, Kan.—City Engineer Melvin Amerman has been directed to advertise for bids for erection of concrete bridge across Coon creek.

Ishpeming, Mich.—A petition has been presented to Council asking for a bridge to be built across the Escanaba river.

Duluth, Minn.—Council has under consideration the building of a new bridge on London road, over the Lester river; the present bridge is a combination of wood and iron, the draw pieces being of iron and the truss rods of wood; it is estimated that a new steel bridge would cost $10,000.

Luzerne, Minn.—Council has voted to construct a steel bridge to replace the bridge at the foot of Main street.—S. L. Chappin, President of Council.

St. Paul, Minn.—The State Soldiers' Home Board has taken no definite action on plans for the proposed new $40,000 bridge leading from the Home to Minnehaha Park; the City Engineer submitted plans for a concrete structure, and bids will be called for the construction of such a bridge, also for plans and bids on a steel bridge; the Legislature appropriated $40,000 for the bridge.

Le Roy, N. Y.—The Le Roy Town Board will call a special election to vote on the proposition of building a new bridge over the Oatka river, in Main street, to replace the dilapidated structure which has been condemned; estimates have been received from J. N. McClintock, County Engineer of Rochester, with plans and specifications which call for a concrete bridge 40 feet in width, with provision for widening it at some future date; estimated cost, $8,000 to $10,000.

Lyons, N. Y.—An election will be held to vote on the question of issuing bonds for aiding in building viaduct over the Central tracks, on Geneva street; the viaduct is to cost $118,000, and one-fourth of the expense will be paid by Lyons.

Palatine, N. Y.—Bonds, $4,500, have been voted for building a bridge across Bargota creek.

Bellefontaine, O.—Logan County has lost many bridges by cloudbursts; plans are being considered for new structures.

Martin's Ferry, O.—The Belmont County Commissioners have decided to build five small bridges on Nixon's Run and Glen's Run; contracts will be let as soon as possible.

Middleton, O.—The Cincinnati Northern Traction Company will pay part of the cost of building county bridge at Tytus avenue, estimated cost of bridge, $15,000; the Cincinnati Traction Company is represented by W. C. Shepherd.

Nelsonville, O.—No bids were received July 22 for the purchase of $12,500 4 per cent., 7-year bridge improvement bonds; they will be readvertised.

Onida, S. D.—The Suley County Commissioners are arranging to build several steel bridges.—Address County Auditor.

North Yakima, Wash.—The Board of County Commissioners has decided to advertise for bids for the construction of several small wooden bridges, in the Moxee Valley, and for an addition of a new 60-foot span river bridge.

Spokane, Wash.—The Sinking Fund Commissioners have decided to advertise for bids for the purchase of $400,000 bonds for the construction of bridge across the Spokane river.—Address City Clerk.

MISCELLANEOUS

Gloucester, N. J.—The citizens have voted $75,000 bonds for improvement purposes.—Address City Clerk.

Hornell, N. Y.—A garbage crematory may be constructed.

Schenectady, N. Y.—The Board of Contract and Supply rejected the two bids opened June 26 for collection and sanitary disposal of ashes, rubbish, garbage and dead animals of the city for five years, beginning October 1, 1907.—L. B. Sebring, City Engineer.

Hamilton, O.—An ordinance is before Council authorizing an issue of $31,000 bonds for city improvements.—Address City Clerk.

Washington, Pa.—It has been decided to organize a stock company to build a garbage disposal plant; ground has been leased and the plant will be 24x34, with a 60-foot stack; estimated cost, $10,000; wagons and 200 tanks will also be required by the company, which will be known as the Washington Garbage Disposal Company.

Altoona, Pa.—A. B. Leach & Company, of New York, have purchased $100,000 worth of city improvement bonds, at a premium of $800.

Wilkes-Barre, Pa.—There is a movement on foot to issue $100,000 worth of bonds, to be used as follows: New police station, $35,000; additional fund East End bridge, $25,000; additional sewers, $40,000; a garbage crematory will also be established very shortly.

Norfolk, Va.—The Board of Control has let contract to the Decarie Manufacturing Company, Minneapolis, Minn., for erection of crematory; cost, $29,000.

BIDS RECEIVED

Decatur, Ala.—The Southern Bitulithic Company has been awarded contract for 25,000 square yards of bitulithic on 5-inch bituminous base, at $2.15, and 6,000 yards vitrified brick on 5-inch cement base, at $2.20; also excavation included; the Columbus Concrete Company was awarded contract for resetting 3,000 lineal feet old stone curb at 6 cents and setting 4,000 feet concrete curb at 28 cents; also 10,800 square yards 1-inch cement sidewalk on 4-inch concrete at $1.07¾, all excavation included; the American Concrete Company, Louisville, Ky., bid $1.21; W. M. Leftwich Company, Nashville, Tenn., $1.24; Nashville Roofing and Paving Company, $1.25; Hot Springs Concrete Company, Hot Springs, Ark., $1.28¼.—W. A. McCalla, City Engineer.

Jacksonville, Fla.—P. Sanford Ross, incorporated, was low bidder for deepening the harbor, etc., requiring the dredging of approximately 165,000 cubic yards, at $3.03 per cubic yard, total $499,950; Capt. Roderick G. Ross, of Jacksonville, bid $3.10 per cubic yard, or $511,500; Southern Dredging Company, $3.98 per cubic yard, or $656,700, and North American Dredging Company, $3.99 per cubic yard, or $658,350; the bids have been tabulated and forwarded to Washington for action.—Major Francis R. Shunk, U. S. Engineer, Officer-in-Charge.

Freeport, Ill.—Wm. Ascher, of Freeport, has been awarded contract for 27,100 square yards of brick on 6-inch rolled stone foundation at $1.30; setting 12,986 feet sandstone curb, 60 cents; 3,600 square yards sidewalks, $1.18; total, $48,200, including 14,891 cubic yards excavation, at 30 cents; total, $50,986; M. Ford bid $1.46 for paving, 54 cents for curb and $1.05 for sidewalks, and Keys & McNamara, $1.49 for paving, 59 cents for curb and $1.18 for sidewalks; total, $53,762.—G. W. Graham, City Engineer.

Mattoon, Ill.—The U. S. Cast Iron Pipe Company has been awarded contract for furnishing 450 short tons 12-inch water pipe, at $34, and Dunkel & Gohring, of Tuscola, contract for laying 11,500 feet 12-inch pipe in 4-3 foot trench, at 33 cents.—Claude L. James, City Engineer.

Indianapolis, Ind.—The Board of Public Works has awarded the following contracts: Sewer, in alley, southeast and west of Bradley street, from Washington street to a point 40 feet south of Michigan street, to Thomas J. Markey & Co., at $1.25 per lineal foot. Sewer in first alley north of Eleventh street, from Sterling to Larch, to William Yates & Co., at $1.03 per lineal foot. Graded roadway, cement walks and curb in Harding street (formerly Schurmann avenue), from Eighteenth street to the canal, to Chas. J. Wacker, at $1.90 a lineal foot. Gravel roadway, cement walks and curb in Cooper street, from Bloyd avenue to Roosevelt avenue, to Graham & Craig, at $3.63 a lineal foot.—Blaine H. Miller, City Engineer.

Lexington, Ky.—Thomas Ahern & Company have been awarded contract to lay concrete sidewalks, complete, on Woodland avenue, at 14 cents per square foot; concrete curbing and guttering, complete, at 50 cents per lineal foot.

J. J. Fitzgerald has been awarded contract to build sewer in Jefferson street, at 79 cents per foot for 8-inch pipe, 38 cents for 5-inch pipe, $30 for manholes, $60 for flush tanks, and $2.50 per cubic yard for rock excavation; the Kentucky Plumbing Company, for sewer in West Third street, at $1.25 per foot for 8-inch and 75 cents for 5-inch pipe, 50 cents for Y's, $30 for manholes, $60 for flush tanks, and $3 per cubic yard for rock excavation. The Ahern Plumbing Company has bid for sewer in West High street at 72 cents per foot for 8-inch and 42 cents for 5-inch pipe, and in Maxwell street at 64 cents per foot for 8-inch and 41 cents for 5-inch pipe; also Y branches in two streets at 50 cents each; manholes, $35; flush tanks, $60; rock excavation, $3, and timber sheathing, $27 per 1,000 feet.—Thos. A. Combe, Mayor.

Augusta, Me.—The contract for the erection of a segregated building for the criminal insane has been let to C. E. Hoxie, of Augusta, for $31,675.—Bigelow T. Sanborn, M. D., Superintendent.

Boston, Mass.—Jones & Meehan have been awarded contract by the Boston Bridge Commission for alterations to bridge between Chelsea and Boston; other bids were: George Hayes, $8,210; Lawler Brothers, $8,160; Cahill Construction Company, $6,386.20; W. H. Ellis, $6,325.25.

Bay City, Mich.—T. J. Wolfe has been awarded contract to furnish material and construct 12-inch socket tile sewer in King street, for $559.65; McLaughlin & Co., 10-inch socket sewer in alleys of blocks 262 and 263 for $290; T. J. Wolfe, 10-inch socket sewer in block 6, for $87.20.—G. Hun, Chairman, Board of Public Works; C. J. Barnett, Secretary.

Grand Rapids, Mich.—Richard Pickett has been awarded contract for the construction of a sewer in Alexander avenue, at $5,987, and James B. Hoey for sewer in Hovey street, for $2,100. All bids submitted for constructing the dock line wall south of Myrtle street were rejected and new bids invited.

Duluth, Minn.—The bid of the Duluth-Superior Dredging Company, of Duluth, of $117,250 in amount, has been accepted by the War Department, for dredging in the harbor of Duluth; the dredging to be accomplished is thus summarized: Item one, Duluth canal, 3,500 cubic yards; two, St. Louis bay, 335,000 cubic yards; three, Nemadji river, 550,000 cubic yards; four, Superior entry, 80,000 cubic yards.

Passaic, N. J.—James Maybury & Son have been awarded contract to improve Van Houten avenue, from High street to Passaic avenue, at $3 for rock excavation, 70 cents for paving, 10 cents for new gutter, 85 cents for new curb and gutter, 50 cents for new curb, $1.80 for new crosswalk, 50 cents for repaved gutter, 12 cents for reset curb, 20 cents for relaid crosswalk and 5 cents for relaid flagging.—David Greenlee, Mayor.

Fargo, N. D.—James Kennedy, of Fargo, was the only bidder for paving North Broadway with creosoted 3-inch blocks on extra heavy concrete foundation, at $3.15 per square yard, excavation 35 cents per yard extra; Kettle Drum sandstone curb, $1.10 per lineal foot; gravel and sand shipped from a distance.—George F. Clark, Town Clerk.

Cincinnati, O.—The County Commissioners have awarded the contract for improving Lickrun Pike to N. Ruebel, at $60,000; for improving Redding Pike, to Geo. Leonard, at his bid of $14,433; and for improving Langdon road, to W. S. Settle, at $4,757.

Columbus, O.—Harry J. Shaw has been awarded the contract for paving Sandusky street with brick, at $36,000.

Crooksville, O.—Adams Brothers have the contract for the pavement of Main street, at $14,867; specifications for paving State street a distance of 3,000 feet are being prepared by the Village Engineer.

Ironton, O.—M. A. Milligan is low bidder for the construction of sewers in a number of streets, his bid being $7,925.

Painesville, O.—A macadam road 10 feet wide is to be built by C. R. Callahan, of Bellevue, O., at his bid of $12,800.

Portsmouth, O.—Kaps Brothers will probably be awarded the contract for paving Sixth street with Peebles block, and the bids on several other streets will be divided between Kelly Brothers and Monroe and Sons.

Pendleton, Ore.—It is reported that P. S. Easterly & Co., of Walla Walla, Wash., have been awarded the contracts to build the steel bridges, one near Milton, connecting the upper county road running between Walla Walla and Milton, and the steel bridge across McKay creek, seven miles south of Pendleton, at $2,650 and $2,984, respectively.

Cresson, Pa.—The contract for constructing sewers (bids opened July 15) has been awarded to R. D. Malone, of Hollidaysburg, for $5,645.—J. B. Rowlson, Clerk of Council.

Dorrancetown, Pa.—Bolton G. Coons has been awarded contract for improving Wyoming avenue, from the Pettebone switch to the Forty Fort borough line, by laying Williams Grove vitrified brick block on concrete foundation, at $2.24 per square yard, and setting Wainwright concrete steel protected curbing at 73 cents per lineal foot.

Ebensburg, Pa.—J. A. Lord, of Hastings, has been awarded contract, bids opened July 30, for erecting concrete bridge 36 feet long, including furnishing of all steel, over Little Paint creek, near Scalp Level, Richland township, for $2,800, and John Ceresa, of Ebensburg, concrete bridge 40 feet long, all steel to be furnished by contractor, over the Conemaugh river, at Portage, for $2,600.—J. B. Lebanon, Clerk, County Commissioner.

Johnstown, Pa.—William H. Zimmerman has been awarded contract to furnish 2,700 street signs at 65 cents apiece; about 25 different designs and bids were considered, and the design of Mr. Zimmerman, which is original, was deemed most suitable.—A. R. Bartley, Chairman, Special Council Committee.

Burlington, Vt.—The Ley Construction Company, of New York City, has been awarded contract for constructing mechanical filtration plant, with electrical equipment, for $36,729; the company bid $37,109 for a plant with steam equipment; the specifications call for a covered reinforced concrete coagulating basin of about 250,000 gallons capacity; four concrete filter tanks, each of a net area of filtering surface of about 200 square feet; and a clear water basin beneath the filters having a capacity of about 100,000 gallons, together with all appurtenances and piping connections to the neighboring water pumping station, low lift centrifugal pumps, wash water pumps, etc. Valves from the Ludlow Valve Manufacturing Company of Troy, N. Y., will be used in the plant.

PERSONALS.

BRAKER, FRED, John O. Johnson and O. W. Brownell, Bemus Point, N. Y., have been selected as a commission to have charge of the construction of a $15,000 water works.

BROWN, JAMES B., W. N. Cox and T. J. Humphreys have been appointed members of the Board of Public Works of Louisville, Ky.

BRUNNER, ARNOLD W., New York City, an architect, has been appointed a member of the Municipal Art Commission of the city to succeed Walter Cook, resigned.

FANNING, J. T., C. E., Minneapolis, Minn., has been making a survey at Omaha, Neb., preparatory to furnishing the city Water Board with an estimate of the cost of the proposed new water works system.

GRESSLE, CARLOS, has been appointed Superintendent of Water Works of Hamilton, O.

HOLMAN, MINARD L., St. Louis, Mo., member of the firm of Holman & Laird, has been engaged by the city of Omaha, Neb., to prepare preliminary plans and estimates for the proposed new water works for the city.

HUNTER, JOSEPH F., State Highway Commissioner of Pennsylvania, has made the following appointments, under a recent reorganization act, passed by the Legislature: Deputy Commissioner, R. D. Beman, Meadville; Assistant Commissioner, G. W. Ensign, Warren. Engineers, C. F. Hamilton, Franklin; F. F. Hallam, McKeesport; C. W. Bosler, Hollidaysburg; E. D. Garrett, Downington; G. H. Biles, Philadelphia; J. R. Wilson, Washington; J. T. Gephart, Lancaster; C. W. Hardt, Camp Hill; A. W. Long, Scranton; S. W. Jackson, Meadville, and W. A. Wynn, Pittsburg. Chief Draftsman, C. E. Douglass, New Castle.

JONES, L. W., Pittsburg, Pa., President of the Pittsburg Filter Manufacturing Company, who has been connected with the company since 1903, has severed his connection with the firm and will open an office in Pittsburg as consulting engineer, making a specialty of municipal and industrial filtration plants, water softening and sewage disposal plants.

KIRKPATRICK, W. G., City Engineer of Jackson, Miss., has been appointed Sewerage Engineer for constructing a system of sewers for Vicksburg, at an estimated cost of $200,000.

LEACH, FREDERICK, formerly City Engineer of Elmira, N. Y., has been appointed City Engineer of Hornell, N. Y.

LEDERLE, DR. ERNEST J., New York City, a member of the State Board of Water Supply, is making an investigation as to the quality of water furnished Seneca Falls, N. Y., by the water works company and that proposed to be furnished by a municipal plant.

LOW, SETH, former Mayor of New York City, has been named by Governor Charles E. Hughes to head the Charter Revision Commission to inquire into the government of the city of New York, and suggest legislation, the other members being ex-Comptroller Edward M. Grout, William M. Ivins, Edward B. Whitney, William N. Cohen, Thomas M. Mulry and Alderman James C. Meyers, with Mayor George B. McClellan and Comptroller Herman C. Metz as ex-officio members.

LUSCOMBE, WILL., Oskaloosa, Ia., Superintendent of the Water Works for many years, has accepted a similar position at Gary, Ind., and previous to his departure was presented with a silver loving cup by his associates and friends.

MCCLELLAN, GEORGE B., Mayor of New York City, is spending the summer at Small Point, Me.

TRADE NOTES

Drawing and Scientific Instruments.—The Keufel and Esser Company, on July 20, opened its new buildings at Adams and Third streets, Hoboken, N. J. The buildings, occupying 30,000 square feet of ground, are built of reinforced concrete by the Turner Construction Company. The shipping room occupies the ground floor of the office building, the officers the second floor and the remainder of the building is for stock. In the manufacturing building, the lower four floors are used for woodworking, lumber being stored in the rear of the lower two floors and separated from the building by a fire wall. The fifth floor is used for paper mounting and the sixth for the manufacture of tapes.

Fire Engines.—A test was recently made of two second-size steam fire engines purchased from the Ahrens Company, of Cincinnati, O. Four streams were connected to a 2-inch nozzle and a stream was thrown 250 feet vertically. The engines developed a capacity of 900 gallons a minute, although the contract with the city called for only 750 gallons. The length of hose used was 150 feet and the draughting water hose 10 feet. In another test the engine maintained a water pressure of from 150 to 170 pounds with two 1 1-8-inch nozzles.

Flange Union.—The Western Tube Company Kewanee, Ill., manufactures a flange union designed to be tight without the use of a gasket. The unions are made of malleable iron, excepting a brass seat, which is screwed into the iron. The convex surface of malleable iron on one pipe comes in contact with the concave surface of brass. The joint is tight even when the pipes are not in alignment.

Iron Pipe.—The McWane Pipe Works, Lynchburg, Va., in its "Monthly Pipe Parley," quotes six-inch pipe in New York and Birmingham at $36 a net ton and in Chicago $37 to $38. Orders are reported a little below the normal.

Motor Roller.—The Austin-Western Co., Ltd., Chicago, Ill., during its first month in the market have sold American Motor Rollers to the following: City of St. Paul, Two Harbors, Minn.; Duluth Township, St. Louis Co., Minn.; City of Hoquiam, Wash.; P. B. Moss, Billings, Mont.; Burke Bros., Ft. Smith, Ark.; Village of Shelby, Mich.; Fayette Co., W. Va.; Harris Co., Tex.; Bradley Co., Tenn.; City of Charleston, W. Va.; Logan Co., O.; Erie Township, Ottawa Co., O.; Highland Township, Elk Co., Pa.; Cherrytree Township, Venango Co., Pa.; Russell Co., Va.

Tarvia.—The Barrett Manufacturing Company, Chicago, Ill., issues a booklet on the Method, Cost and Results of Tarviating Heavily Traveled Macadam Streets in Chicago, from information furnished by Mr. Linn White, Engineer of the South Park Board of Commissioners, Chicago, Ill. During 1906 the Commissioners treated with tar 106,000 square yards of the most heavily traveled boulevard streets in the city. In treating Michigan avenue the upper three inches of the macadam was loosened with picks in the wheels of a road roller, which was followed by a team with a harrow. After drying the tarvia was applied hot, limestone screenings scattered about and the surface rolled. On Drexel boulevard it was only necessary to clean and level the surface of the macadam before applying the tarvia.